Tennessee Valley Authority
Office of Nuclear Power

NMRG

TVA NUCLEAR

Review of Operational Readiness Corrective Actions

Sequoyah Nuclear Plant

Report No. R-88-01-SQN
March 1988

Nuclear Manager's
Review Group

Tennessee Valley Authority
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1. EXECUTIVE SUMMARY

As requested by the Manager of Nuclear Power, the Nuclear Manager's Review Group (NMRG) assessed the effectiveness of corrective action taken for the concerns identified in the Operational Readiness Review (ORR) Report dated January 5, 1988, and for the items identified as restart recommendations in the INPO assist visits during the weeks of October 26 and November 16, 1987. The onsite review commenced on January 15 and was completed (except for follow-up areas) on February 23, 1988. The review of follow-up areas was completed on March 3, 1988. It was concluded that all areas are satisfactory for restart.

In performing the assessment, the NMRG team utilized the same methods as the ORR team: review of documentation, interviews, and performance-based observations. The NMRG team used the same standards, performance objectives, and criteria as the ORR team. Performance was observed in the classroom, the simulator, and in the plant.

The ORR commenced in late August 1987. An interim ORR report was issued in October 1987. Corrective actions in most areas were started by that time. The NMRG observed that the corrective actions have resulted in performance which is satisfactory for restart in all areas identified as restart by the ORR team and INPO. The principal contributors to improved performance were: fundamental management commitment to change, new emphasis on communication of goals and standards, and a positive attitude toward improvement at all organizational levels.

Positive performance observations that illustrate the conclusion of satisfactory performance for restart are as follows:

- Proper conduct was observed in formality of operations, e.g., communications, watch relief, and respect for reactivity.
- Operators demonstrated satisfactory awareness of plant conditions and a conservative, questioning approach to their actions.
- Senior management has demonstrated a commitment to a continuing program of self-assessment.
- Satisfactory performance was observed in procedural discipline, e.g., compliance, on-the-spot corrections, and avoiding procedure substitutes.
- Trended chemistry results indicate a heightened awareness and appreciation of chemistry control.
- Radwaste temporary configurations have been reviewed for safety and operational impact. Operators demonstrated satisfactory operational performance and system configuration awareness.
- Utilization of Shift Technical Advisors was effective.

- Assistant Unit Operators demonstrated satisfactory performance. Enhancements in training and certification were strong contributors as well as a positive attitude on the part of AUOs.

- Satisfactory understanding and appreciation of reactivity transients were observed in simulator training. The Safety Parameter Display System was effectively used.

- Administrative controls, e.g., night orders, operator aids, independent verification, and clearances, are satisfactory to support restart.

- Operators demonstrated satisfactory diagnostic skills.

- Changes to control room access entry guidelines and the establishment of a work control group have effectively limited control room operator distractions.

- Plant management overview of simulator training is occurring on a scheduled basis.

- A designated individual, the system engineer, is assigned responsibility for each plant system. Uncertainties regarding "ownership" of plant systems have been corrected.

- Significant improvement in management attitude towards radiological controls has been observed.

The NMRG team identified several opportunities for further improvements as part of the longer range goal of achieving excellence in all areas. Two areas were identified as needing continuing close management attention to achieve the desired performance.

- Radiological controls performance.

- Critical self-evaluation, particularly at the supervisory and middle management levels.

2. INTRODUCTION

A. Background

On January 5, 1988, the Manager, Office of Nuclear Power (ONP), directed the NMRG to conduct a review of the corrective actions taken by Sequoyah Nuclear Plant (SQN) in response to the concerns identified in "Sequoyah Nuclear Plant (SQN) - Operational Readiness Review (ORR) - Report of - FCF-1-88." SQN subsequently issued "Response to Report of Sequoyah Readiness Review - Restart Issues" on February 10, 1988, with corrective actions identified. An assessment by NMRG of those corrective actions is provided by this report. An assessment of areas identified by INPO as restart items in the assist visits held during the weeks of October 26 and November 16, 1987, is also included.

B. Team Structure

The review team consisted of eight NMRG personnel and one loanee from the Division of Nuclear Training (DNT).

Team members included:

G. R. Mullee - Team Leader - Director, NMRG
T. W. Overlid - Assistant to Director, NMRG
R. D. Smith - Chief, NMRG Support Review Branch
R. D. Greer - NMRG Group Manager, Support Review Branch
G. J. Stein - NMRG Group Manager, Operations Review Branch
B. M. Gore - NMRG Senior Nuclear Evaluator
W. F. Gillen - NMRG Nuclear Evaluator
A. M. Carver - NMRG Nuclear Evaluator
J. O. Marshall - Acting Chief, Bellefonte Training Branch

C. Methodology

The NMRG team used the same methods as the ORR team: review of documentation, interviews, and performance-based observations. The team also used the same standards as the ORR team, including applicable Institute of Nuclear Power Operations (INPO) performance criteria and objectives, to focus the review on the concerns identified by the ORR team.

NMRG team preparation included required reading of ORR-related materials including INPO 85-001, "Performance Objectives and Criteria for Operating and Near-Term Operating License Plants." Also viewing INPO videotape on communications, a Georgia Power videotape on common sense communications, and extensive training on the ORR report were required for each NMRG team member.

Observations were performed in the control room, in the plant, in classrooms, and in the simulator. All six operating crews assigned to unit 2 startup were observed in classroom training and simulator sessions during week one of operator requalification training or special unit 2 startup training. Three of these crews were observed in the control room to verify proper in-plant performance.

To ensure consistency between the ORR team and the NMRG review team, the NMRG team leader, an ORR participant, conducted cross-check observations in the simulator and in the control room.

D. Performance Improvement During the Review

During the review, corrective action was continuous. Plant personnel initiated action on their own and as concerns were identified by NMRG. Accordingly, some of the items identified for further improvement in this report may already be corrected. Performance continued to improve throughout the review. At the conclusion, performance was satisfactory for restart in all areas and many further improvement actions had been initiated.

3. ASSESSMENT

This section follows the outline and numbering sequence of the ORR report "Operational Readiness Review (ORR) - Report of - FCF-1-88" transmitted to S. A. White on January 5, 1988. The review of each ORR concern is broken down into the following sections for ease of relating the NMRG assessment to the original ORR concern.

ORR Concern - A quote of the original ORR concern.

ORR Concern Basis - A brief summary of the basis of the original ORR concern.

NMRG Assessment - An assessment of the effectiveness of corrective action as observed during the review.

Areas for Further Improvement - Areas where opportunities exist for further improvements as part of the longer range goal of achieving excellence in all areas.

I. STANDARDS OF OPERATIONS

A.1 ORR Concern

"Operations are not conducted with the degree of formality necessary for a proper businesslike approach."

A.2 ORR Concern Basis

Instances of informal operations were seen during in-plant and simulator training observations. Specific problem areas identified by the ORR team were: communications, control room access, watch relief, logkeeping, alarms, respect for reactivity, and personnel conduct.

NMRG Assessment

Formality is Satisfactory for Restart

The NMRG observed performance in all areas and found that appropriate standards were met. Additionally, Sequoyah Administrative Instruction (AI)-30, "Nuclear Plant Conduct of Operations," has been revised and provides proper direction for continuation of those standards. The NMRG observations in the individual subject areas addressed by the ORR team are listed below.

A.2.a. Communications

Positive Observations

Simulator and control room observations confirm that communications are performed in accordance with proper standards. Examples of positive observations are noted below:

- o Precise orders were given with proper repeat backs.
- o Orders were given in clear, crisp language.
- o Nonessential phone calls have been effectively diverted from the control room; e.g., during a three-hour observation, the assistant shift supervisor (Asst. SS) received only five phone calls.
- o The public address system was noted to be limited to the infrequent paging of operators.
- o In an observation of a radio conversation between an assistant unit operator (AUO) and a control room operator, verbatim repeat backs were used.
- o Operators used repeat backs to ensure communications were received. During a simulator observation, an operator was observed repeating information several times until acknowledged by the Asst. SS.
- o A shift supervisor (SS) asked his operators several times if they had heard what he said whereupon he received a repeat back.

Areas for Further Improvement

Some individual improvements are still needed in communications. Examples of potential improvements include:

- o Telephone communications were not always as formal as required; e.g., precise repeat backs are not always used.
- o Individual differences in communication skills were observed in the simulator. Follow-up action was not always taken to achieve uniformly high standards of excellence.

A.2.b. Control Room Access

Positive Observations

Entry guidelines have been established to minimize the adverse effects of excess personnel in the control room.

- o Control room and horseshoe area access control practices were observed to be effective.
- o Observations confirmed that control room access during watch relief was properly limited.

Areas for Further Improvement

None observed.

A.2.c. Watch Relief

Positive Observations

Shift and individual turnover meetings were effectively held.

- o Individual watch reliefs observed were conducted with the proper formality. There was no sharing of the watch. Watch relief was announced, acknowledged, and properly logged.
- o Shift turnover meetings were complete and informative; e.g., equipment out of service was noted, lessons learned and operational events were discussed, and limiting conditions for operation (LCOs) were identified by number and description.
- o Complete AUO turnovers were observed, including thorough log reviews.
- o Control room individual turnovers were observed to be complete and effective.

Areas for Further Improvement

On several occasions, during shift turnover meetings, outside distractions made hearing the SS difficult.

A.2.d. Logkeeping

Positive Observations

Logkeeping was observed in the simulator and in the plant. Logkeeping was properly conducted.

- o Proper AUO logkeeping was observed on most occasions.
- o Proper logkeeping was observed during simulator training.
- o Control room logs were spot checked and only isolated problems were noted.

Areas for Further Improvement

The February 10, 1988 plant response to the ORR report stated that AUO logs are for information only and not subject to audit. That practice was a concern to the ORR team.

A.2.e. Alarms

Positive Observations

Appropriate alarm and annunciator responses were observed.

- o Proper alarm acknowledgment and verification practices were observed in the simulator. Training and management observers were actively critiquing this item to ensure effective performance.
- o Proper alarm response practices were observed in the control room.

Areas for Further Improvement

Some individuals' response to alarms still needs improvement. Continued emphasis by SSs on watch and in the simulator should achieve continued improvement.

A.2.f. Respect for Reactivity

Positive Observations

During observations of special operator training, simulator exercises, and an examination administered at the end of the training, operators demonstrated a proper respect for reactivity.

- o Unit 2 startup training provided a comprehensive review of reactor physics. The course included topics identified by both the ORR and INPO reviews.

  Examples include:

  - Estimated Critical Position (ECP) calculations were formally performed.

  - The shift technical advisor (STA) formally calculated dilution rates/quantities.

  - The SS performed in-depth reviews of ECPs calculated by STAs.

- o Simulator observations confirmed that operators demonstrated a proper knowledge of and respect for core reactivity.

- o Startup training included examinations to ensure that subject matter was effectively communicated.

Areas for Further Improvement

None observed.

A.2.g. Personnel Conduct

Positive Observations

Personnel conduct in the simulator and the control room was observed to be professional and businesslike.

- o During simulator sessions, management and instructors observed the few instances of leaning against panel railings and critiqued the occurrence with both the individual and the crew.

- o Operators were observed to comply with the requirements for properly wearing personal dosimetry.
- o Operators were observed to conduct themselves in a businesslike manner.
- o During simulator observations, operators paid strict attention to control panels.
- o Operators generally confirmed that actions taken produced the expected results.

Areas for Further Improvement

None observed.

B.1 ORR Concern

"The knowledge of plant conditions, on the part of onwatch operations personnel, appeared to be less than adequate."

B.2 ORR Concern Basis

Onwatch personnel were not aware of some plant conditions.

NMRG Assessment

Knowledge of Plant Conditions is Satisfactory for Restart

Operators were well aware of existing plant conditions.

- o Shift turnover meetings were observed to emphasize existing plant conditions, e.g., a bubble in the pressurizer.
- o During in-plant observations, AUO awareness of plant conditions was good.
- o Spot checks of knowledge in the control room revealed no deficiencies.

Areas for Further Improvement

None observed.

C.1 ORR Concern

"Personnel did not display conservatism and a questioning approach to essential operating information in plant operations."

C.2 ORR Concern Basis

A lack of conservative and questioning approach to plant operations was noted. Examples include: failure to understand reasons for procedural steps, inability to predict plant responses to operator actions, independent verification, and double boundary isolation.

NMRG Assessment

There is a Conservative/Questioning Approach Which is Satisfactory for Restart

A conservative and questioning approach to plant operations was observed.

- o Simulator, control room, and in-plant observations demonstrated that a conservative and questioning approach to plant operations was practiced; e.g., control room operators thoroughly discussed existing plant conditions and the effect on the plant prior to performing a Surveillance Instruction (SI).

- o Simulator observations included several positive instances of a conservative and questioning approach; e.g., a simulator syncroscope that was not operating properly was thoroughly discussed and resolved.

- o Several instances of separation of second-party verifiers were observed. Physical separation of second-party verifiers will be procedurally implemented in June 1988.

- o Respect for chemistry control and its importance was demonstrated several times in the simulator when crews questioned and resolved analyses results before proceeding with startup.

- o Appropriate notification of plant management was consistently observed in the simulator.

Areas for Further Improvement

The February 10, 1988 plant response to the ORR report did not adopt double boundary isolation (an ORR concern).

- o An in-plant observation noted an instance where a single valve was used for isolation against the pressure of a running pump.

D.1 ORR Concern

"A long shutdown period and considerable employee turnover has occurred during the last two years. This will have a decided impact on individual sensitivity to plant conditions and on the ability to respond correctly to them."

D.2 ORR Concern Basis

The concern addresses the readiness of the Chemistry and Radiological Control (Radcon) staff to support restart with qualified, experienced personnel. A lack of practice exercises in both areas was noted.

NMRG Assessment

Chemistry and Radcon Staffing is Satisfactory for Restart

Staffing of Chemistry and Radcon is adequate to support power operations.

Chemistry:

- Two technicians qualified in accordance with American National Standards Institute (ANSI) N18.1 - 1971 "Selection and Training of Nuclear Power Plant Personnel" have been assigned to each of the six shifts. Included in each shift is at least one technician with three or more years of operating experience.

- Each Radiochemical Laboratory Analyst (RLA) has received gamma spectroscopy training to support the review of results required during power operation.

- Plans are being prepared to conduct practice exercises for chemistry analysts by using blind samples and requiring accuracy of results within predetermined limits.

Radcon:

- At least four technicians qualified in accordance with ANSI N18.1 - 1971 with SQN operating experience, have been assigned to each shift.

- In-plant drills simulating high airborne activity were being conducted. A drill observation indicated success in identifying and correcting deficiencies. Radcon managers actively participated in the drills and critiques.

Areas for Further Improvement

None observed.

E.1 ORR Concern

"The concept of critical self-evaluation of performance appeared to be absent from normal operations functions."

E.2 ORR Concern Basis

The concern addresses manager and supervisor involvement in plant and personnel performance and plans for corrective action.

NMRG Assessment

Critical Self-Evaluation is Satisfactory for Restart

Senior management has clearly demonstrated an appreciation of the significance of critical self-assessment.

- o Plant management evaluated and critiqued operator restart and requalification training on a scheduled basis.
- o Plant events that occurred during entry to mode 4 were critiqued by the plant manager during shift turnover meetings.

Areas for Further Improvement

Several observations demonstrated the need for continued close management attention to critical self-evaluation.

- o Many of the deficiencies identified by NMRG reviewers during the course of this review were so readily apparent that they should have previously been corrected by SQN supervisors and managers during routine walk your spaces tours.
- o Radcon management did not have an effective self-assessment program. Subsequent to NMRG discussions with management, action was initiated to improve performance in this area.
- o Plant management representatives in the simulator and the shift operating advisor (SOA) did not consistently critique performance to the same standards of excellence. It was not planned to conduct a practice critique for SOAs at the start of their assignment until suggested by NMRG.

II. PROCEDURES

A.1 ORR Concern

"The failure to clearly define, implement, and enforce the requirements for procedural compliance could lead to operational problems."

A.2 ORR Concern Basis

Anomalies were found in compliance with formal procedures. Instances were noted where plant operations were conducted without approved procedures.

NMRG Assessment

Procedural Compliance is Satisfactory for Restart

Operations personnel demonstrated satisfactory appreciation of the need for procedural compliance.

- In-plant, simulator, and control room observations revealed good use of and compliance with procedures.
- Operations personnel attended a course on conduct of operations presented by Westinghouse Corporation. This course included strengthened management emphasis on procedural compliance.
- AI-30 provides specific guidelines and requirements for procedural compliance.

Areas for Further Improvement

Continued management attention should be directed to compliance with administrative process procedures.

- Contrary to AI-3, "Clearance Procedure," operator aids were used in place of caution tags.
- Inconsistent control of access into a hazardous area was observed. One door into the area was controlled, another was not.

B.1 ORR Concern

"The necessary positive steps to correct specific operating procedure deficiencies sometimes were not taken."

B.2 ORR Concern Basis

Personnel exhibited a willingness to continue an evolution with a known procedure deficiency rather than first correcting the deficiency.

NMRG Assessment

The Approach Toward Procedures is Satisfactory for Restart

Observations of plant personnel noted a questioning attitude and a commitment to correct procedures before continuing.

- An AUO performing a radwaste recirculation and sampling process appropriately stopped, questioned, and verified the procedure with a drawing before proceeding.
- An improper practice of signing off procedural verification steps based upon telephone reports was appropriately questioned by an AUO. Proper performance of the signoffs was then observed.
- All operating crews completed a course developed by Westinghouse Corporation covering the correction of procedure deficiencies.
- A special project team has been formed to carry out an overall procedure upgrade program.

Areas for Further Improvement

None observed.

C.1 ORR Concern

"Management support for procedure compliance was not always evident where needed to effect necessary improvements in operator performance."

C.2 ORR Concern Basis

Operations management allowed the use of operator aids, caution tags, and night orders to avoid procedure changes.

NMRG Assessment

Management Attention to Avoiding Procedure Substitutes is Satisfactory for Restart

Strengthened management attention to preclude using alternate means to avoid procedure revision was observed.

- A review of night order logs revealed that night orders were not used in place of operating procedures.
- Sequoyah Nuclear Plant Standard Practice Administrative (SQA) 142, "SQN - Control Panel Posted Material", was revised to address the concern of operator aids used in place of procedural changes.
- The operations supervisor assigned an individual to review all operator aids with respect to current procedures.

Areas for Further Improvement

Night orders were being used as substitutes for administrative procedures.

III. CHEMISTRY CONTROL

A.1 ORR Concern

"The lack of adequate chemistry control results in undesirable periods of out-of-specification conditions."

A.2 ORR Concern Basis

Most managers have not fully supported the chemistry program and the need for procedural compliance to chemistry limits. As a result, numerous instances of out-of-specification chemistry have resulted.

NMRG Assessment

Control of Chemistry is Satisfactory for Restart

Increased management attention has resulted in good chemistry control.

- Chemistry data for the months of November 1987 through January 1988 indicated that there were no out-of-specification conditions for plant systems covered by the daily trend charts.
- Daily trend charts covering selected chemistry parameters were published and distributed to plant operators and key managers.
- Conservative administrative limits have been established to give early warning of adverse trends.
- Simulated out-of-specification conditions were identified and resolved by operators during simulator training.

Areas for Further Improvement

None observed.

B.1 ORR Concern

"Actions to correct out-of-specification chemistry conditions are not always timely. In some circumstances, planning of operations was not adequate to ensure proper control of chemistry."

B.2 ORR Concern Basis

Slow reaction to out-of-specification conditions and poor work sequencing resulted in lengthy delays in correcting chemistry problems.

NMRG Assessment

Correction of Chemistry Problems is Satisfactory for Restart

Chemistry and Operations promptly addressed and corrected chemistry problems.

- o Daily trend charts were used to detect adverse trends and initiate corrective actions.
- o Operations and chemistry communications helped to maintain chemistry within limits for systems covered by the daily trend charts.
- o Online monitoring equipment is under development to increase the speed of obtaining chemistry results.
- o Chemistry was expanding its capability by setting up a laboratory for backup counting and analysis.
- o Training given to Senior Reactor Operators and Reactor Operators emphasized proper chemistry control and communications with Chemistry.

Areas for Further Improvement

None observed.

C.1 ORR Concern

"Abnormal chemistry conditions do not receive adequate management attention."

C.2 ORR Concern Basis

Inattention to chemistry limits and equipment condition indicate a need for a commitment to more effective corrective actions.

NMRG Assessment

The Commitment to Maintain Chemistry Limits and Equipment is Satisfactory for Restart

Management corrective actions have addressed chemistry equipment condition and involvement in chemistry control.

- o Daily trend charts indicated that chemistry was maintained within limits.
- o Attention to material condition was evident; titration room equipment work requests (WRs) were issued and the room was cleaned.
- o A previously canceled Design Change Request (DCR) has been reinitiated to make the boric acid sampling station operational.
- o During an observation, an RLA and a trainee were knowledgeable of the procedure and the reason for the analysis. Both displayed a professional attitude.
- o Licensed operators observed during simulator training displayed a questioning approach to chemistry and involved Chemistry personnel when warranted.

Areas for Further Improvement

Additional attention needs to be focused on the documentation of chemistry goals and objectives and Radcon practices when handling radioactive samples.

- o Chemistry goals and objectives will be included in the next scheduled revision of SQA 129, "Site Goals and Objectives, Sequoyah Nuclear Plant".
- o During a chemistry lab observation, two RLAs were observed not following proper radiological practices.
  - The RLAs were not wearing all protective clothing required by the radiation work permit (RWP). The Chemistry Shift Supervisor stated that the RLAs had verbal concurrence from Radcon to relax RWP requirements in the laboratory.
  - The RLAs were touching noncontaminated items with potentially contaminated gloves. When pointed out by NMRG, the Chemistry manager took immediate corrective action. A follow-up observation verified the effectiveness of the corrective action.

IV. RADIOLOGICAL WASTE SYSTEM

A.1 ORR Concern

"The Radioactive Waste (Radwaste) System is in a temporary configuration which makes operating the system difficult and error prone."

A.2 ORR Concern Basis

At least 13 Temporary Alteration Control Forms (TACFs) were in effect on the radwaste system, some dating from 1981/1982. Efforts to remove those temporary changes were not evident. Continued operation with those temporary changes in place could cause problems in radwaste handling.

NMRG Assessment

The Radwaste System is Satisfactory for Restart

Radwaste system configuration problems were being addressed. All radwaste system TACFs have been reviewed for safety and operational aspects.

- The condensate demineralizer waste evaporator (CDWE) has functionally replaced both the coolant waste evaporator (CWE) and the auxiliary waste evaporator (AWE). A second CDWE is proposed for long term back up to the existing unit. This should alleviate the need for outside contractor processing of radwaste when a CDWE is down for maintenance.

- Several DCRs have been issued to correct the hardware problems identified by the ORR. Some DCRs are scheduled for completion in fiscal year 1988.

- An independent review of all radwaste TACFs was performed during the SQN Baseline effort and was documented in the system notebooks. All radwaste TACFs were declared out-of-bounds, i.e., ruled not to affect the Final Safety Analysis Report (FSAR) chapter 15 events, and thus would not affect system safety.

- Operational aspects of the radwaste system were also independently reviewed during the SQN Baseline effort and were covered in the system notebooks. Actions required to resolve system problems were identified and placed on the SQN unit 2 restart list. The items were being resolved by the follow-up to the baseline program.

Areas for Further Improvement

The radwaste system needs continuing management attention to ensure the timely removal of the identified temporary changes and to reduce the difficulty of chemical analysis during radwaste solidification.

- o DCRs to remove an 80-foot temporary hose from a radwaste system and to correct a plugged radwaste drain had not been scheduled.

- o The difficulty in determining the required pH and boron concentration of radwaste during solidification identified by the ORR team continues.

B.1 ORR Concern

"The temporary changes in effect and the quantity of radioactive liquids involved are not providing the degree of careful and formal operations routinely needed for the Radwaste system."

B.2 ORR Concern Basis

Radwaste system configuration was not always correct or known by radwaste operators. Radwaste procedures were not always followed, and radwaste liquid and resin transfers were not always continuously monitored.

NMRG Assessment

Operation of the Radwaste System is Satisfactory for Restart

Radwaste TACF configuration control problems have been corrected, and radwaste AUO performance in this area is satisfactory.

- o TACFs missing from the auxiliary building operator office system flow diagram have been added. Auxiliary building operator office drawings have been formally controlled.

- o On two occasions, radwaste AUOs were observed performing tours of their assigned area. Both were proficient in watchstanding duties and demonstrated good procedure compliance.

Areas for Further Improvement

Emphasis needs to be placed on the continuous monitoring of liquid and resin transfers.

- An AUO was observed attempting to simultaneously perform two independent liquid transfers. The resulting lack of continuous monitoring led to a small spill. The AUO immediately notified Radcon and the spill was properly handled.

V. SHIFT TECHNICAL ADVISOR

ORR Concern

"The STA is not being effectively utilized to accomplish the intended function of providing technical advice pertaining to assuring safe operation of the plant."

ORR Concern Basis

Team building and STA acceptance have suffered by their exclusion from rotating crew assignments. STAs were assigned other duties inconsistent with their intended role.

NMRG Assessment

Utilization of the STA is Satisfactory for Restart

STAs are effectively used in the simulator and in the control room.

- To help build teamwork and confidence, STAs have been assigned to specific operating crews.
- Observations revealed that the STAs were serving as crew members, providing a source of additional technical knowledge.
- STAs have been given direct access to all control room areas.
- STAs have been relieved of administrative duties in order to concentrate on their principal function of assisting to maintain reactor safety.
- STAs are required to demonstrate satisfactory knowledge of plant systems, theory, and shift requirements prior to mode 2 certification.
- During observed simulator exercises, STAs demonstrated satisfactory knowledge of ECP calculations and the use of Safety Parameter Display System (SPDS) use.

Areas for Further Improvement

Simulator observations indicated that some STAs need additional practical systems training.

VI. ASSISTANT UNIT OPERATOR QUALIFICATION MAINTENANCE

ORR Concern VI

"The current rotation schedule for the AUOs does not assure that an AUO assigned to a specific station has maintained watchstanding proficiency for that station from an operational familiarity standpoint."

ORR Concern Basis

Watchstation rotation, the number of watchstations. [illegible] AUO continuing training did not assure AUOs maintained watchstand[illegible] proficiency.

NMRG Assessment

AUO Performance and Qualification Maintenance are Satisfactory for Restart

AUO performance was observed to be satisfactory, and corrective actions have been incorporated into administrative instructions.

- All AUOs observed demonstrated satisfactory watchstanding practices.
- AUO inspections included equipment not specifically included on individual round sheets.
- All AUOs are being required to pass a watchstation certification examination. Several examinations were observed to be conducted in a thorough and professional manner. The NMRG observers agreed with the passing grade given by the evaluators.
- The number of watchstations requiring AUO certification has been reduced.
- AUO watchstation assignments are tracked to ensure recertification for periods of absence greater than six months.
- AUOs demonstrated positive attitudes and were receptive to feedback.
- Individual turnovers were thorough and informative.
- AUOs complied with prescribed radiological practices.

Areas for Further Improvement

- Additional assignments from shift supervision, e.g., supporting SI performance, prevented the AUO from completing required rounds on two occasions.

- The number of hours spent on shift at a specific station to maintain certification is not specified.

- Some additional attention to detail is needed in AUO watchstanding; e.g., a small oil spill on a diesel generator engine was overlooked until pointed out by NMRG.

VII. PLANT ADMINISTRATIVE CONTROL

A.1 ORR Concern

"The lack of complete and accurate information available to the operators, because of plant and/or drawing changes associated with temporary alterations, increases the possibility of operator errors."

A.2 ORR Concern Basis

Improvements were needed with temporary alterations to: reduce backlog, limit issuance, and strengthen the temporary alteration process.

NMRG Assessment

Temporary Alterations are Satisfactory for Restart

The temporary alteration process was satisfactory for restart.

- Two TACF discrepancies noted in the ORR report have been corrected.
- Five unit 2 TACFs reviewed by NMRG were properly indicated on applicable drawings.
- General Operating Instructions require Operations to review TACFs each time the plant enters mode 4 from cold shutdown. All outstanding TACFs on each system are reviewed prior to declaring a system operable.
- All new TACFs require a screening review and/or an unreviewed safety question determination (USQD). The review includes a drawing update if applicable.

Areas for Further Improvement

Continued management attention is needed to reduce the number of open TACFs.

- One-hundred and six of 144 TACFs noted during the 1986 INPO visit are still open. Closure is substantially behind the plant's own internal schedule.
- Design changes to clear TACFs are not prioritized for either the design or the installation process.

B.1 ORR Concern

"The night orders are being employed as a substitute for preparing or changing both operating and administrative procedures."

B.2 ORR Concern Basis

Night orders were used to supercede existing procedures and to avoid new ones. Up-to-date night order logs were not maintained at all workstations.

NMRG Assessment

Night Orders are Satisfactory for Restart

Night orders were not being used in place of operating procedures. The number of night orders has been reduced, and outdated night orders have been removed.

- o Review of night order logs at four workstations indicated that night orders were not being used in place of operating procedures.
- o Outdated night orders have been removed from the night order logs.
- o The number of active night orders has been reduced.

Areas for Further Improvement

Further management attention is needed in the area of night orders.

- o Evaluate the SQN guidelines used for night orders against the criteria in INPO 85-017, "Guidelines for Conduct of Operations at Nuclear Power Stations, Section XVI, Shift Order."
- o Several workstation night order logbooks did not contain all current night orders.

C.1 ORR Concern

"Operator aid postings are being used in lieu of Caution or Hold Tags and procedure revisions. Deficiencies previously identified by INPO had not been corrected."

C.2 ORR Concern Basis

Operator aids observed in the plant were inconsistent with both INPO guidelines and SQA 142.

NMRG Assessment

Operator Aids are Satisfactory for Restart

The plant procedure on posting of control panel material has been revised. Management has addressed the correction of operator aids and assigned review responsibility.

- SQA 142 was revised to address the concerns identified in the 1986 INPO report.
- Three independent NMRG walk-throughs revealed no widespread problems in the use of operator aids.
- NMRG walk-throughs noted numerous areas in the plant where permanent placards had replaced previously uncontrolled information.
- The operations section supervisor has assigned an individual the responsibility to review all operator aids against the revised SQA 142 requirements.
- The SS and SOA have the assigned responsibility to evaluate the implementation of SQA 142.

Areas for Further Improvement

Considerable effort has been made in the operator aid program to comply with INPO guidelines, but additional improvements are needed to reach the desired level of excellence.

- Operator aids for the residual heat removal (RHR) system isolation valves indicated power "off," valves "closed." Actual positions of both valves were "open" with power "on."
- Procedural reference to a posted control room operator aid could not be located by operators.

- An operator aid indicating cooling water requirements for a motor bearing was used in place of an appropriate caution tag.

- Sixteen unauthorized operator aids were observed outside the control room; e.g., on the 480-volt Turbine Building Common Motor Control Center, "B," "Raw Service Water Pump D" was written with a black marker on the breaker cabinet.

D.1 ORR Concern

"The safety of personnel and protection of equipment is not fully assured by the current use of tagouts."

D.2 ORR Concern Basis

Improvement was needed in attention to detail with respect to the conduct of AI-3, "Clearance Procedure."

NMRG Assessment

Conduct of the Clearance Procedure is Satisfactory for Restart

A revision of the clearance procedure and management monitoring of its implementation have satisfactorily addressed this concern.

- ONP and site management, along with the SOAs, are monitoring the implementation of the clearance procedure through direct observations.

- Additional emphasis has been placed on attention to detail through procedural changes and training.

- A dedicated tagging crew working through the SS has been assigned the responsibility of performing clearances.

- AI-3 has been revised to eliminate the use of a caution order as a safety tag.

Areas for Further Improvement

None observed.

E.1 ORR Concern VII.E

"Current independent verification practice doesn't fully assure that the valve and electrical lineups are correct for the intended operations."

E.2 ORR Concern Basis

The independent verification practice did not require physical separation of verifiers. Check sheets and system drawings used for system alignment did not contain all the applicable valves.

NMRG Assessment

Satisfactory for Restart

The plant has committed to implement the practice of complete separation of independent verifiers.

- By June 1, 1988, complete separation of independent verifiers will be required by procedure.
- Management has stressed that when traveling together each individual must separately verify the action.
- Several observations noted satisfactory independent verification.

Areas for Further Improvement

The February 10 response did not include a schedule for validating valve and equipment checklists against system drawings. This was an ORR concern.

VIII. TECHNICAL KNOWLEDGE

A.1 ORR Concern

"An understanding and working knowledge of core reactivity changes resulting from various activities were lacking."

A.2 ORR Concern Basis

Deficiencies were noted in technical knowledge of core reactivity changes and ECP calculations among some operators and chemistry personnel.

NMRG Assessment

Technical Knowledge of Reactor Theory is Satisfactory for Restart

During simulator training, operators displayed a satisfactory knowledge of core reactivity changes.

- o Classroom and simulator instruction on core reactivity changes was presented as part of unit 2 startup training.
- o During simulator observations of reactor startups and reactivity changes, operators demonstrated a satisfactory knowledge of reactor theory and core reactivity.
- o During simulator observations, STAs demonstrated satisfactory knowledge of ECP calculations, shutdown margin, and Inverse Count Rate Ratio (ICRR) approaches to criticality.
- o Chemistry personnel were trained on the relationship between boron chemistry control and core reactivity.
- o Observations of chemistry personnel showed a satisfactory level of knowledge of the effects of boron on core reactivity.

Area for Further Improvement

None observed.

B.1 ORR Concern

"A lack of complete familiarity and appreciation for the capability of the SPDS was evident."

B.2 ORR Concern Basis

Plant personnel did not demonstrate an effective use of the SPDS as a working tool to enhance operations.

NMRG Assessment

Satisfactory for Restart

During simulator training, operating crews (including STAs) have shown good knowledge and use of the SPDS system.

- Operations crews received training on the SPDS as part of the unit 2 startup training.
- During simulator training, observations of reactor startups and emergency operations showed that operating crews have a good knowledge of and ability to use the SPDS system.

Areas for Further Improvement

None observed.

IX. TRAINING

A.1 ORR Concern

"The operating crews did not show uniformly good skills in diagnosing plant problems."

A.2 ORR Concern Basis

During simulator training a number of cases were observed where diagnostic evaluation of plant conditions was below the expected level which led to incorrect responses.

NMRG Assessment

Diagnostic Skills are Satisfactory for Restart

During simulator and control room observations, operators demonstrated satisfactory diagnostic skills.

- o Training on diagnostic skills was included in the unit 2 startup training and was completed on February 19, 1988.
- o All unit 2 crews demonstrated satisfactory diagnostic skills. Verification was accomplished by evaluation and critique following each simulator exercise.
- o Simulator observations verified that the SS was directing crew activities in order to maintain overall cognizance of plant conditions and required corrective actions.

Areas for Further Improvement

None observed.

B.1 ORR Concern

"Insufficient time is being allocated each year for maintenance personnel retraining. The lack of sufficient numbers of skilled craftsmen to perform maintenance in some specialized areas is of special concern."

B.2 ORR Concern Basis

Interviews indicate maintenance planners lack schooling in their current jobs beyond on-the-job training. There were also indications of training needs in the Electrical Maintenance Group on the diesel generators and alarm panel annunciator solid-state circuitry.

NMRG Assessment

Maintenance Planner Training is Satisfactory for Restart

DNT has developed and was implementing a plan to close this concern. Upon completion of the scheduled action, this concern should be resolved.

- o Courses identified in the Maintenance Planner Training Curriculum have been developed. The training program was scheduled to be implemented March 14, 1988 (32-hour course).

- o Training schedules for the first half of 1988 have been established for the electrical, instrument, and mechanical maintenance groups. The scheduled courses should provide enhanced technical training for maintenance personnel.

- o The sequence of properly valving out differential pressure (d/p) units is covered in the instrumentation training program. Instrument mechanics are reminded of the sequence for valving out a d/p instrument through required reading.

- o Maintenance group supervisors were required to review weekly activity reports from the SQN Maintenance Training Section.

- o DNT has conducted training in specialized areas.

  - Emergency Diesel Generators

  - Reverse Acting Tandem Governor System

  - A 40-hour Annunciator Maintenance Course, that provides extensive coverage of TVA and vendor print reading for electricians.

Areas for Further Improvement

None observed.

C.1 ORR Concern

"Certain key features appear to be missing from the program used to assure that requalification training is focused toward areas of greater need."

C.2 ORR Concern Basis

a. ORR follow-up discussions on the apparent need for additional training in selected areas raised questions about continuing training needs.

b. Effective line management involvement and assessment of performance were necessary to ensure that the investment in training produces the desired improvement in plant performance.

Requalification Training is Satisfactory for Restart

a. DNT has developed and was implementing a plan to close this concern. Upon completion of the scheduled action, this concern should be resolved.

- o DNT has committed to revise operator retraining by June 30, 1988. When revised, the training will require the following:
  - Formal analysis of Nuclear Regulatory Commission (NRC)-type requalification examination results for areas needing further specialized training.
  - Formal review of operating crew performance for identification of specific training needs.
  - Upgrade documentation requirements for the basis of training topic selection.
  - Input from the operations evaluators based on their performance assessments.
- o DNT established and staffed an internal assessment unit whose primary function is to evaluate the effectiveness of training activities.
- o DNT designated an instructor to evaluate and record commonly missed examination questions which have been tracked since mid-January 1988.
- o Nuclear industry operating experience events were included in operator training.

b. Plant management attended, evaluated, and critiqued operator training on a regularly scheduled basis.

- o Management attended unit 2 startup training for all crews.
- o Management has been scheduled to attend designated requalification training.

Areas for Further Improvement

None observed.

D.1 ORR Concern

"The conduct and evaluation of simulator exercises do not take full advantage of the training environment opportunity to instill proper standards of operation."

D.2 ORR Concern Basis

Weaknesses in formality, communications, and knowledge of plant conditions were observed during simulator sessions. These did not receive adequate attention during the post-drill critiques.

NMRG Assessment

Simulator Training is Satisfactory for Restart

DNT was implementing a corrective action plan and simulator exercise guide to correct this concern.

- o Unit 2 restart training had two simulator instructors assigned. Requalification training will have two instructors (presently only one) assigned as soon as personnel become available.
- o DNT is developing an interim training procedure that will establish general rules of conduct and philosophy for conducting simulator sessions. This is to be completed by June 1988.
- o A management observer was present during the simulator exercise portion of unit 2 startup training.
- o Simulator exercise guides included an observation guide which was developed from an INPO-supplied guide. The observation guide included the evaluation of standards of conduct contained in AI-30.

Areas for Further Improvement

Ensure that the commitment to provide two simulator instructors is promptly implemented.

E.1 ORR Concern

"The simulator training situation did not always correspond to a real plant situation."

E.2 ORR Concern Basis

There were some physical and procedural areas that did not accurately reflect the in-plant conditions.

NMRG Assessment

Simulator Fidelity is Satisfactory for Restart

Enhancements to simulator realism concerns had been implemented.

- o During simulator training exercises, the crew members located themselves in areas much like that of the plant control room.
- o Response times more accurately reflect plant realism in obtaining results or reports.
- o Observed ECP and boron concentration calculations were formally performed.
- o An action plan study has been performed to identify the need for simulator certification to comply with the March 19, 1987 Title 10, Code of Federal Regulations (CFR), Part 55 Revision. Completion of this plan should correct ORR concerns on simulating real plant configuration. A target completion date of April 1989 has been established.

Areas for Further Improvement

None observed.

F.1 ORR Concern

"Simulator training is not being used to the maximum potential to document the need for design or procedure changes in the plant."

F.2 ORR Concern Basis

Situations during simulator exercises were observed where there were clear signs that plant design or operating procedure changes would have been required.

NMRG Assessment

Feedback to Design/Procedures from the Simulator is Satisfactory for Restart

DNT has taken corrective action to resolve this concern.

- Training procedures include requirements for collection of feedback pertaining to procedure improvement and simulator performance.

- A DCR was submitted to address the difference between flow through the simulator pressurizer versus flow through the plant pressurizer.

- The ORR item regarding a procedural step requirement for stopping the containment spray pumps while switching suctions has been evaluated. The step was determined necessary to meet the systems design criteria and avoid pump damage.

- Emergency contingency actions (ECAs) 3.1 and 3.2 have been issued to address a steam generator tube rupture in combination with a loss of coolant accident (LOCA). ECAs were included in requalification training.

- An evaluation of the steam dump valves will be performed to determine if the cycling and cycling duration are detrimental. The evaluation completion date is one month after full power operation.

Areas for Further Improvement

None observed.

X. RADIOLOGICAL CONTROL

ORR Concern

"Many aspects of Radcon are not at the requisite level of excellence. If Radcon management fails to continue the recent high level of attention, and if the other site and plant organizations fail to take on the radiological responsibilities that go with their jobs, then the Radcon program will not improve sufficiently to support power operations."

ORR Concern Basis

The ORR report and the appended INPO report described problems in technical knowledge of Radcon technicians, poor attitudes, interfacing skills, and training. Also described were problems concerning personnel compliance with Radcon requirements.

NMRG Assessment

Satisfactory for Restart

No restart-impacting deficiencies were observed. This assessment was reached by NMRG following four weeks of extensive review.

- Prompt corrective action was initiated when performance and administrative deficiencies were identified by NMRG.
- Senior, experienced technicians have been assigned to each shift crew.
- Subsequent to NMRG commenting on the need for improvement, managers and supervisors have become more involved in daily field activities (providing coaching and on-the-spot corrections when warranted).
- NMRG observations noted continuing improvement in attitudes, interfacing skills, and personnel compliance with Radcon requirements.
- A new bioassay system featuring enhanced detection capability was placed in service February 16, 1988.
- More conservative protective clothing requirements have been adopted in some radiologically controlled areas resulting in an improved margin of personnel protection (e.g., surgeons caps and hoods instead of caps only).

- Consolidation of radioactive byproduct material control and accountability under Radcon has been completed. This should reduce the incidence of administrative deficiencies observed in this area.

- Airborne radioactivity sampling techniques were more accurate in reflecting actual breathing zone conditions.

- Spontaneous teamwork was observed between Radcon, Mechanical Maintenance, and Operations during valve repair in a radiologically controlled area. This resulted in reduced potential contact with radioactive contamination while preventing undue work delays.

Areas for Further Improvement

Continued close management attention is needed to:

- Strengthen critical self-assessment and prompt initiation of performance improvement based on assessment results.

- Refine training programs to upgrade knowledge levels of general employees and Radcon personnel.

- Implement enhanced radiation protection standards promptly as they are developed.

- Reduce the interval between personnel radiation exposure and dose tracking system update.

- Achieve full personnel compliance with Radcon requirements, e.g., personal frisking when exiting radiologically controlled areas.

- Close out concerns identified in the ORR report.

XI. MAINTENANCE ACTIVITIES

A.1 ORR Concern

"Dedication of extra resources to compensate for existing maintenance program inadequacies may not be maintained after startup or be adequate for the new plant modes. This could adversely impact safe and reliable operations."

A.2 ORR Concern Basis

Deficiencies in the maintenance program include: lack of periodic material condition inspections, incorrect work packages, scheduling, work flow and control, and performance measurement.

NMRG Assessment

The Maintenance Program is Satisfactory for Restart

This concern was a longer range action. Corrective actions already taken or in progress include the following:

- The planning and scheduling group has been divided into two independent groups to improve efficiency.
- Planners have been assigned individual system responsibilities to assist in identifying recurring systems/component problems.
- All work requests/maintenance requests (WR/MRs) were reviewed by qualified individuals to identify priorities and ensure that operational requirements were established prior to work performance.
- Work activities were scheduled three days in advance on a preliminary daily work list (DWL).
- A 5-day, 2-week, and 2-month look ahead on maintenance/modification work activities identifies outstanding action items.
- The plant trending program included the necessary equipment to meet Nuclear Plant Reliability Data System (NPRDS) guidelines. Equipment beyond that required by NPRDS was also included.

Areas for Further Improvement

Interviews and observations indicated that further attention is needed to more effectively utilize maintenance crews.

- o Minor contingency work was not always provided to foremen in the event priority work was delayed.

- o Foremen performed administrative functions, e.g., ensuring work package drawings and/or procedures were current. This detracted from the time allotted to conduct close in-plant supervision.

B.1 ORR Concern

"The need for the operations control room staff to support maintenance activities, by the approval and control of work, is causing excessive distraction to the control room operators. This could cause a plant safety risk if continued during critical operations."

B.2 ORR Concern Basis

Onwatch control room operators performed administrative duties, e.g., processing WRs that detract from the operators effectiveness in monitoring plant conditions.

NMRG Assessment

The Control Room/Maintenance Interface is Satisfactory for Restart

A plant procedure was revised and implemented which appropriately limited control room access.

- o A work control group consisting of offwatch licensed operators has been established outside the control room. The group performs front-end evaluation of maintenance activities without interfering with control room operators.

- o Control room observations indicated a minimum number of maintenance-related distractions of onwatch operators.

- o Several workstation counters have been established outside the control room to handle maintenance work authorizations.

- o Observations verified that control room access by non-operations personnel was effectively limited.

Areas for Further Improvement

None observed.

C.1 ORR Concern

"The existing facilities for storing test meters and equipment in the Instrument Shop is inadequate. It does not assure that test equipment remains in a satisfactory condition to perform properly when required."

C.2 ORR Concern Basis

Deficiencies were noted in measuring and test equipment (M&TE) storage facilities, e.g., potential for equipment damage due to inadequate storage space and lack of testing facilities.

NMRG Assessment

M&TE is Satisfactory for Restart

This was a longer range concern. Plans were reviewed which schedule the construction of a facility to house all plant M&TE by June 1988.

Areas for Further Improvement

None observed.

XII. SYSTEM ALIGNMENT

ORR Concern

"The practices employed for system alignment did not provide full assurance that valve and electrical lineups are correct."

ORR Concern Basis

System alignment practices were unnecessarily complex and did not incorporate appropriate human engineering considerations. Additionally, independent verification did not provide full assurance of correct lineups.

NMRG Assessment

System Alignment Control is Satisfactory for Restart

Initial mode 4 configuration discrepancies have been corrected. A review was conducted on the new plant configuration control procedure. Independent verification is addressed in the NMRG assessment of ORR Concern VII.E.

- During initial attempts to enter mode 4, system lineup problems were identified. Following procedural revisions, the plant was successfully configured for mode 4. The plant has concluded, based upon the procedure improvements and monitoring of the alignment, that proper assurance of the lineup exists.

- The new AI-58, "Maintaining Cognizance of Operation Status - Configuration Status Control" has been revised to include review and approval by the SS and control of multiple data entries.

Areas for Further Improvement

- System alignment checklists still do not include physical locations of valves and power supplies.

- Implement the physical separation of independent verifiers for future alignments (scheduled for June 1988).

XIII. RESTART TESTING

ORR Concern

None

ORR Concern Basis

There were no ORR concerns in this area. ORR field observation of actual tests did not raise concern about the adequacy or accuracy of SQN restart test activities. Accordingly, NMRG did not address this area.

XIV. PLANT RESPONSIBILITIES

A.1 ORR Concern

"Evidence exis that responsibility and accountability for plant systems is lac. g."

A.2 ORR Concern Basis

A number of system-related problems were identified. A contributing factor was the lack of dedicated system engineers or other means of system ownership.

NMRG Assessment

The Assignment of Systems Engineers is Satisfactory for Restart

The assignment of system engineers to a single organizational unit was in progress. Responsibilities are detailed in SQA-168, "System Engineer." Implementation should fully address the ORR concern.

Areas for Further Improvement

Complete the assignment of system engineers.

B.1 ORR Concern

"Actions taken to implement the concept of plant "ownership" by Operations could lead to confusion as to the responsibilities of various support organizations."

B.2 ORR Concern Basis

Confusion could exist between Operations and system engineers due to wording in AI-30 regarding "ownership" of plant systems.

NMRG Assessment

Plant Ownership is Satisfactory for Restart

Proposed procedure changes should remove confusion with respect to plant "ownership."

- o AI-30 was being revised to clarify concerns raised by ORR regarding "ownership." Plant ownership resides with operations. Other plant groups support operations.
- o SQA-168 has defined the responsibilities of system engineers.

Areas for Further Improvement

Complete the revision of AI-30.

XV. INPO RECOMMENDATIONS

INPO assistance visits during the weeks of October 26 and November 16, 1987, identified certain items as restart recommendations. NMRG performed an assessment of corrective actions for those concerns. The results are reported below.

A. INPO Recommendation IV.A.1

"Prior to Unit 2 startup, plant procedures for reactor startup should be revised to provide guidance on the utilization of source range counts and rod height data as a tool for predicting criticality. Additionally training should be provided for each licensed operator, senior operator and STA to ensure correct utilization and understanding of the doubling method for reactor startup."

INPO Recommendation Basis

Lack of training and adequate procedural direction led to operating errors in the simulator.

NMRG Assessment

Startup Procedures and Training are Satisfactory for Restart

NMRG observation of simulator training indicated satisfactory performance in this area.

- o Startup procedures provided guidance on utilization of source range counts and rod height data as tools for predicting criticality.
- o Unit 2 startup training was observed. Operators and STAs demonstrated clear knowledge of the count rate doubling method for monitoring reactor startup.

Areas for Further Improvement

None observed.

B. INPO Recommendation IV.A.2

"Prior to Unit 2 startup, provide clear direction in applicable procedures that define when it is appropriate to calculate or verify shutdown margin (SDM). Procedures should direct the operator to calculate or verify SDM whenever required by technical specifications or when the SDM is in doubt due to abnormal indications or count rate."

INPO Recommendation Basis

Procedural guidance was not provided to the operator to ensure adequate SDM.

NMRG Assessment

Procedures for SDM are Satisfactory for Restart

Procedures have been revised to address this recommendation, and simulator observations confirmed proper operator actions.

Areas for Further Improvement

None observed.

C. INPO Recommendation IV.A.4

"Prior to Unit 2 startup, all Westinghouse Owners' Group (WOG) Emergency Response Guidelines (ERGs) that are not included in the station emergency operating procedure (EOP) base should be carefully reviewed for implementation, unless a sound technical basis exists for exclusion. Verification, validation, and training needs to be conducted on any new EOPs resulting from this review."

INPO Recommendation Basis

This item also addressed ORR concerns on plant procedures that are addressed under Section II of the ORR report. The recommendation focuses on the eight WOG ERGs that were not incorporated in the plant EOPs.

NMRG Assessment

Emergency Operating Procedures are Satisfactory for Restart

All INPO concerns have been satisfactorily addressed.

- Five of the WOG ERGs have been incorporated into new ECAs; technical justification for not including the other three has been documented.

- Validation and verification of the new ECAs were observed being effectively conducted.

Areas for Further Improvement

None observed.

D. INPO Recommendation IV.B.1

"Prior to the startup of Unit 2, establish administrative controls over alignment data that will ensure the data used is the most current."

INPO Recommendation Basis

Data used to perform functional checks of the high level bistable was obtained from an uncontrolled loose leaf binder in the instrument control shop. The INPO summary section specified that only controls over nuclear instrumentation (NI) alignment data were required for restart.

NMRG Assessment

Control of Alignment Data is Satisfactory for Restart

Procedure changes have been implemented that address this concern.

- o NI procedures require the current copy of the data from previous alignments and tests to be obtained from the Reactor Engineering Section prior to using the procedures.
- o NMRG verified that Reactor Engineering Section has on file the current copy of the data.

Areas for Further Improvement

The February 10, 1988 plant response to the ORR report satisfactorily addressed control of NI data. However, further long-range action is needed to properly control all instrument calibration and alignment data.

E. INPO Recommendation IV.C.3

"During the special training that will be conducted prior to Unit 2 startup, include the following topics:

a. rod control
b. reactivity effects
c. shutdown margin
d. use of doubling
e. plant response during normal loading and unloading of the generator
f. communications

If the topics are already included, review the training materials for adequate depth and scope."

INPO Recommendation Basis

During simulator observations, INPO noted operator weaknesses in the areas addressed above.

NMRG Assessment

Startup Training was Satisfactory for Restart

NMRG observations confirm that the subject matter addressed by INPO was properly covered in unit 2 restart training.

Areas for Further Improvement

None observed.

F. INPO Recommendation IV.B

"Provide the crew training to correct the problems noted above. The training should address the following topics:

a. emergency instruction bases
b. emergency instruction rules of usage
c. conduct of operations
d. communication techniques
e. fundamentals of diagnostics, with emphasis on attention-to-detail, control panel monitoring, as well as analyzing, predicting, and tracking of plant parameters and response
f. simulator practice sessions that enforce teamwork, diagnostic fundamentals, and use of procedures."

INPO Recommendation Basis

INPO simulator observations identified one operating crew that needed improvement in the above-noted areas.

NMRG Assessment

The Performance of the Crew Which Needed Special Training is Now Satisfactory for Restart

The crew specified by INPO has been given the listed training and is now satisfactory for startup.

- o Special training for the entire crew was completed in January 1988.
- o The SS was replaced by a more experienced SS.
- o NMRG observed satisfactory crew performance during unit 2 startup training.

Areas for Further Improvement

None observed.

APPENDIX A

LIST OF ACRONYMS USED IN THIS REPORT

Administrative Instruction	AI
American National Standards Institute	ANSI
Assistant Shift Supervisor	Asst. SS
Assistant Unit Operator	AUO
Auxiliary Waste Evaporator	AWE
Code of Federal Regulations	CFR
Condensate Demineralizer Waste Evaporator	CDWE
Coolant Waste Evaporator	CWE
Daily Work List	DWL
Design Change Request	DCR
Differential Pressure	d/p
Division of Nuclear Training	DNT
Emergency Contingency Action	ECA
Emergency Operating Procedure	EOP
Emergency Response Guideline	ERG
Estimated Critical Position	ECP
Final Safety Analysis Report	FSAR
Institute of Nuclear Power Operations	INPO
Inverse Count Rate Ratio	ICRR
Limiting Conditions for Operation	LCO
Loss-of-Coolant Accident	LOCA
Maintenance Request	MR
Measuring and Test Equipment	M&TE
Nuclear Instrumentation	NI
Nuclear Manager's Review Group	NMRG
Nuclear Plant Reliability Data System	NPRDS
Nuclear Regulatory Commission	NRC
Office of Nuclear Power	ONP
Operational Readiness Review	ORR
Radiation Work Permit	RWP
Radioactive Waste System	Radwaste
Radiochemical Laboratory Analyst	RLA
Radiological Control	Radcon
Residual Heat Removal	RHR
Safety Parameter Display System	SPDS
Sequoyah Nuclear Plant	SQN
Sequoyah Nuclear Plant Standard Practice Administrative	SQA
Shift Operating Advisor	SOA
Shift Supervisor	SS
Shift Technical Advisor	STA
Shutdown Margin	SDM
Standard Operating Instruction	SOI
Surveillance Instruction	SI
Temporary Alteration Control Form	TACF
Unreviewed Safety Question Determination	USQD
Westinghouse Owners' Group	WOG
Work Request	WR

APPENDIX B

DISTRIBUTION

cc (Attachment):

RIMS, MR 4N 72A-C
H. L. Abercrombie, ONP, Sequoyah
C. E. Ayers, LP 6N 25D-C
M. S. Blackburn, POTC-C
J. R. Bynum, LP 6N 38A-C
J. P. Darling, ONP, Bellefonte
F. C. Fogarty, ONP, Watts Bar
C. H. Fox, Jr., LP 6N 38A-C
R. L. Gridley, LP 5N 157B-C
W. H. Hannum, BR 1N 77B-C
T. B. Jenkins, LP 3N 41A-C
R. J. Johnson, POTC-C
N. C. Kazanas, LP 4N 45A-C
J. A. Kirkebo, W12 A12 C-K
W. R. Lagergren, LP 6N 38A-C
C. C. Mason, LP 6N 38A-C
J. L. McAnally, LP 5S 83E-C
H. P. Pomrehn, Browns Ferry
J. R. Ratliff, IBM 3N 47A-C
G. L. Rogers, LP 6N 38A-C
S. J. Smith, ONP, Sequoyah
G. Toto, ONP, Watts Bar
W. Wegner, LP 6N 38A-C

TVA 64 (09-9-85)

UNITED STATES GOVERNMENT

Memorandum

TENNESSEE VALLEY AUTHORITY

TO : S. A. White, Manager of Nuclear Power, LP 6N 38A-C
J. R. Bynum, Assistant Manager of Nuclear Power, LP 6N 38A-C

FROM : H. L. Abercrombie, Site Director, O&PS-4, Sequoyah Nuclear Plant
S. J. Smith, Plant Manager, POB-2, Sequoyah Nuclear Plant

DATE : March 3, 1988

SUBJECT: RESPONSE TO REPORT OF SEQUOYAH READINESS REVIEW - FINAL REPORT, AND RESTART RECOMMENDATION

Attached are the Sequoyah Nuclear Plant (SQN) responses for all of the concerns and recommendations identified in the Report of Sequoyah Readiness Review dated January 5, 1988.

In our previous transmittal of Response to Report of Sequoyah Readiness Review - Restart Issues, dated February 10, 1988, we stated we would provide a restart recommendation separate from this final report.

Because of the timing of several activities, we find it possible to make our restart recommendation as part of this final report.

We have verified SQN's readiness for restart by confirming the following actions:

- All restart commitments in the Report of Sequoyah Readiness Review - Restart Issues have been completed and responses for completion of the long-term issues are part of the attached report.

- The observations of the Shift Operating Advisors confirm that operations performance for each area of concern in the Report of Sequoyah Readiness Review, dated January 5, 1988 is satisfactory for restart.

- The observations of the Shift Operating Advisors confirm that operations shift crews supporting unit 2 restart, including Shift Technical Advisor, have demonstrated satisfactory performance.

- Management observation of operator performance, operator training, maintenance performance, and the performance of radiological control activities indicate a level of performance that will support restart.

- The INPO followup visit on February 16 and 17, 1988 resulted in an INPO letter report dated February 29, 1988 stating that all previously identified INPO items related to the startup of unit 2 have been

satisfactorily addressed. This report did contain one new restart recommendation which reads, "Operations Management presence in the Control Room needs to be increased to provide control room crew direction during the unit 2 restart." In response to this, we are ensuring senior operations management involvement and presence during special or unusual activities such as, the approach to and initial mode 2 operation, initial turbine roll, other mode changes and critical testing activities. Testing activities will be assessed in advance to ensure those requiring senior management attendance are identified. We will ensure that this coverage includes backshift and weekends.

Based on these activities and our personal observations and knowledge, we recommend that SQN unit 2 be allowed to go to mode 2 and mode 1 as soon as permitted by existing license requirements and other commitments.

J. R. Bynum	H. L. Abercrombie	S. J. Smith

LLJ:SSC
Attachments
cc (Attachments):
RIMS, MR 4N 72A-C

0097s/sam

INPO REPORT - APPENDIX C

REPORT OF SEQUOYAH READINESS REVIEW
RESPONSE FOR RESTART AND POSTRESTART ISSUES

INTRODUCTION

The staffs of Sequoyah Nuclear Plant and the Division of Nuclear Training, with assistance and input from other Office of Nuclear Power Divisions, the Site Director's Staff, and the Assistant Manager of Nuclear Power, have developed these responses.

Many of the actions reflected in the responses were initiated before the Sequoyah Readiness Review. However, the Readiness Review identified several areas where the actions were not yielding the desired results at the pace needed to support unit 2 restart. The Readiness Review was very useful in determining where additional and/or different priorities were needed.

Many actions and adjustments were begun in October 1987 when the Readiness Review Team made its interim report available. Because the corrective actions were well underway before the Final Report of Sequoyah Readiness Review was issued on January 5, 1988, the responses in many cases reflect completed actions or substantial progress. They are not quick fixes, conceived and implemented in the past few weeks.

A large number of the concerns and recommendations were about attitudes and principles that have to be instilled through leadership, accountability, and responsibility. These types of concerns cannot be corrected by writing a procedure, developing a program, or issuing a directive. The reference to procedures, where made, indicates that plant and corporate management have tried to express the acceptance criteria for certain actions. Plant management is clearly aware that the key to success is performance. Plant management is committed to improving performance and is continuing to raise the standards of conduct while removing impediments to their achievement.

The responses show that the Sequoyah staff has been responsive to the recommendations of the Readiness Review Team and the Institute of Nuclear Power Operations (INPO). Site and plant management believes the actions resulting from this review will enhance the safety of plant operations. The responses indicate that site and plant management is committed to standards of excellence for the operation of Sequoyah. They do not indicate that management believes that Sequoyah has attained the level of performance necessary for long-term operating reliability. This report is a major initiation point for continuing improvements that will put Sequoyah on the list of best industry performers.

CONCERN - ORR I.A

1. Operations are not conducted with the degree of formality necessary for a proper business like approach.

2. Specific areas of concern included the following:
   a. Communications
   b. Control Room Access
   c. Watch Relief
   d. Log Keeping
   e. Alarms
   f. Respect for Reactivity
   g. Personnel Conduct

RESPONSE

Since September 1987 there has been a concentrated effort to establish standards of excellence regarding formality in operations. The areas of concern identified by the ORR team and INPO have received specific attention. These standards are documented in a new administrative instruction (AI-30) entitled Nuclear Plant Conduct of Operations which was a joint effort of the Sequoyah Operations Group and the Division of Nuclear Training, Operations Training Branch. AI-30 was the first of a number of conduct of operations procedures that are being written for all of the technical groups and specialized staffs to better establish the standards for operation. The requirements of AI-30 have been disseminated to operations personnel by teaching the shift supervisors (SS) the requirements and then having them teach their own crew.

Special training sessions and meetings have been held with operations group personnel to convey to them the need for and importance of increased formality. One example of this is an intensive one day presentation to each of the six operations crews concerning conduct of operations. This training was presented to all operator classifications including shift technical advisors (STA). This very professional special session was conducted at an offsite location to free personnel from routine work interruptions and to impress upon them the importance that management places on this subject. Major industrial accidents such as Chernobyl, the Bhopal India Chemical release and airplane crashes were discussed in the context of how the lack of a businesslike attitude of the employees contributed to the accidents.

In addition to establishing new standards for formality, the control room environment has been improved. Access to the control room is more closely controlled and even those permitted access must not interrupt operations personnel during specified shift turnover (STO) periods. Work requiring approval by control room personnel now is screened at a continuously manned station which is outside the unit and common control boards area to minimize distraction for operations personnel at the controls.

There has been an increase in sensitivity to reactivity control by changing procedures to increase attention to this vital area during reactor startup and by emphasizing reactivity control in special training sessions and during simulator use. In addition to the training for operators, special training sessions for chemistry personnel will be completed by February 15, 1988.

Because a businesslike approach to operating a nuclear plant requires attention to many details, management has initiated a number of tangible changes that will foster professionalism. There has been a significant cleanup of the plant areas, improvements in plant appearance and better organization of work spaces. More emphasis has been placed on shift crews as teams including chemistry, radiological control and the STA and there is a commitment to providing distinctive dress for operations personnel. These actions plus the constant attention to formality in training, regular staff meetings, Shift Supervisor/Assistant Shift Supervisors meeting and by supervisors while walking their spaces have resulted in improvements in formality and professionalism.

NOTE: The titles "Shift Supervisor" and "Assistant Shift Supervisor" are synonymous with Shift Engineer and Assistant Shift Engineer respectively. The titles have recently been changed from Engineer to Supervisor.

A number of specific areas were of concern to the ORR Team. These are individually addressed below to show how each has been incorporated into current policy. The statements are excerpts from plant instructions.

CURRENT POLICY

1. Communications

   a. Acknowledgement:

      The sender should ensure the intended individual receives the message when two or more people are in the immediate area. The intended individual should be addressed by name and the sender should await an acknowledgement to ensure the communications cycle is complete.

      Reference: AI-30, section 16, page 22

   b. Repeat back:

      All verbal communications of a directive nature (ie, reposition valves, etc.) shall be repeated back verbatim by the recipient to the originator prior to the directions being carried out.

      Reference: AI-30, section 16, page 22

c. Hand Signals:

The use of sign language is discouraged except in accepted industry practice, such as among crane operators, or as defined below:

Hand signals are to be used when the operating environment (noise level, face mask, etc.) prohibits the use of voice communication. The intent of these hand signals is to provide a means of controlling valve operations for specific tasks as they should arise.

The individuals involved with the specific task shall be briefed prior to performing the task in the use of the hand signals. See Attachment F for illustration. (Examples of areas where hand signals may be needed.)

(1) Inside polar crane wall with reactor coolant pump (RCP) running

(2) el 690' pipe chase and el 669' pipe chase

(3) Accumulator rooms

(4) East/West valve rooms

(5) Positive displacement charging pump (PD) pump rooms

(6) Centrifugal charging pump (CCP) rooms

Reference: AI-30, s ction 16, page 23

d. Clear and crisp language:

All communications shall be clear and precise. This is essential in both verbal and written communications. All operational communications shall be conducted in a formal and professional manner.

Good communication techniques and practices will be utilized at all times. They are as follows: (Those that pertain to this concern.)

(1) Communications must be free of ambiquity; avoid the use of slang terms and words that sound alike. Example: Would you get 578 D. Would you get 578 B. ("B" sounds like "D") Better way: Close 578 Delta or Close 578 Bravo.

(2) Be specific; use equipment nouns names and I.D. numbers. Example: Manually close unit one Bravo residual heat removal (RHR) to chemical and volume control system (CVCS) letdown, hand control valve 74-530.

(3) Use the phonetic alphabet when communicating alpha-numeric information. See Attachment D for listing. This is not necessary when referring to standard approved abbreviation like RHR or CVCS.

(4) Take time when reporting abnormal conditions. Speak deliberately, distinctly and calmly. Identify yourself and watchstation or your location. Describe the nature and severity of the problem. State the location of the problem if appropriate. Keep communication line open if possible until directed otherwise.

Reference: AI-30, section 16, pages 20 and 21

e. Numerous incoming telephone calls:

As an aide in helping reduce the communications load on the control room, the following has been established:

Personnel requiring knowledge of plant status may do so through the War Room. The War Room is manned 24-hours per day.

When trying to make contact with the main control room (MCR), if the message is of a routine nature, the sender should hang up when the MCR fails to answer after the fifth ring to avoid unnecessary control room noise. The phone shall be allowed to ring until answered if the information is important to Operations.

Outside telephone calls shall be of an emergency nature only.

Any phone conversations should be limited to those that are plant related and also limited in duration; this will both reduce possible distractions and keep the lines of communication open.

Reference: AI-30, section 14, page 16
section 15, pages 18 and 19
section 16, page 24

f. On public address (PA) usage:

The plant PA system may be used to summon operators, to call or to update plant personnel on the status of an abnormal or emergency condition, change of plant status, or give notification of major plant events in progress or anticipated.

Speak slowly and deliberately in a normal tone of voice.

When announcements of abnormal or emergency conditions are made, they should be made twice or three times.

Identification of sender may be omitted, but may be appropriate in emergency conditions.

The announcement of the starting or tripping of large equipment or loud equipment may be appropriate to help prevent alarming personnel who may be working in the vicinity of this equipment.

NOTE: In an emergency situation (time permitting) the operator should announce over the PA the action to take place for equipment starts. Normally, the assistant unit operator (AUO) will check the equipment prior to starting and also let personnel in the area know what is about to take place. The AUO will then call the unit operator (UO) and remain in contact with him during the start process to report possible problems.

Reference: AI-30 section 16, page 25

g. Radio transmissions:

Identify yourself and watchstation.

Use professional language.

Repeat back messages verbatim.

Sender should confirm repeat back.

If signal breakup is experienced, use better communications means if possible.

Reference: AI-30, section 16, page 24

h. Imprecise orders:

See section d. (Clear and crisp language) of this policy statement. In addition, the following firms up policy on precise orders:

Do not use unnecessary information which could be interpreted as a message. Example: After an operator is directed by the senior operator (SO) to close FCV-74-94, the operator says something like "Let's see, I know this valve is over here somewhere, 74-94, 74-94 here it is." The proper method is: Just repeat back, "I am to close FCV-74-94". The SO will acknowledge by saying, "Understood". Then find the valve, close it, and report to the SO that "FCV-74-94 is closed".

In issuing directions for a complex evolution, consideration should be given to reviewing the overall evolution using a system

flow diagram or other appropriate reference with the individual who is to carry out the directions.

If there is any doubt concerning any portion of the communication or task assigned, resolve it before taking any action.

Reference: AI-30, section 16, pages 20 and 21
AI-30, section 16, pages 21 and 22

i. On voices too low (not forceful):

Use a loud voice when communicating important messages. This distinguishes important messages from casual talk.

Reference: AI-30, section 16, page 21

2. Control room access.

a. Too many personnel in the control room:

The number of people in the control room will depend on plant conditions and each individual's ability to effectively deal with people (Use a common sense approach).

The UO, assistant shift supervisor (Ast. SS) or SS has the authority to terminate activities and/or expel any person from the control room if he determines that the activities are adversely affecting his capability to operate the unit in a safe manner.

Only persons requiring access by virtue of their work assignment shall be in the unit control room.

In order to prevent excessive numbers of people or activities from affecting the quality of operation within the control room, the following guidelines are established:

(1) In an effort to ensure that the operators are allowed to place their undivided attention on control of plant activities and conditions, contact with the control room shall be minimized to that which is absolutely necessary.

(2) As an aide in helping reduce the communications load on the control room the following has been established:

(a) Personnel requiring knowledge of plant status may do so through the War Room. The War Room is manned 24 hours per day.

(b) Counters are installed at the units 1 and/or unit 2 entrance to the control room. Personnel requiring

access to the control room must have their need to do so verified at the counter before obtaining entry permission.

Reference: AI-30, section 14, page 16

b. Watch relief access restriction:

Access to the control room during the shift turnover period of 0730 to 0800, 1530 to 1600 and 2330 to 2400 is not allowed for anything except urgent and emergency conditions.

Reference: AI-30, section 14, page 16

3. Watch Relief

a. Watch Sharing and Clear Announcement and Acknowledgement of Watch Relief:

The offgoing watchstander shall retain the responsibilities of the job until he has fully informed his relief of the status of all equipment under his jurisdiction. Unless emergency conditions exist, the relief operator will perform no onwatch duties until he/she completes established relief requirements, documents those requirements properly, and also makes a verbal acknowledgement of assuming shift. The oncoming SO will determine he/she is fully cognizant of the duty stations problems and/or activities.

Reference: AI-5 Shift Relief and Turnover (now in the revision process), page 2

b. Advance signing of watch relief checksheet:

The watch relief checksheet will be signed only at the exact time of assuming the watch.

Reference: AI-5, page 2

c. Prompt and proper oncoming watchstands checksheet documentation:

(see b. above on advance signing of checksheet).

Reference: AI-5, page 2

d. Effective turnover briefings:

Shift Turnover (STO) meetings conducted by the SS will require professionalism and formality in all phases of the shift relief process. Daily standing orders* issued by the operations group manager will be used to direct the shift operating crew through

the SS. A complete and effective STO will be given as outlined in Section 2.2.1 of this instruction. The SS will review and discuss new temporary alteration change forms (TACF) during the shift turnover.

Reference: AI-5, page 1, paragraph 21 (currently in revision).

* The operations group manager will issue daily standing orders (see attachment C) to direct the operating crew, through the SS, to the objectives and goals that the operating crew will maintain or achieve during their assigned shift. These standing orders are not intended to cause any operation outside of plant procedural bounds. They will be more conservative and restrictive as a rule.

Reference: AI-5, section 10, page 10, *note.

e. Offgoing UO leaving before oncoming reactor operator (RO) returned to the control room and leaving without relief and permission:

Persons assigned to jobs shall remain on them until properly relieved by someone of equal or higher classification or released by his supervisor. All operators will inform their immediate supervisor of their location if other than their duty station. The Shift Supervisor will inform MCR he is leaving and designates a replacement command function supervisor.

Reference: AI-5, page 2

f. Relieving the watch without previously having reviewed the logs:

The individual being relieved is responsible for passing on all pertinent information concerning work under his jurisdiction to his relief. He shall bring particular attention to abnormalities which have occurred or exist and significant journal entries.

Reference: AI-5, page 2

Operators (all classifications) and STAs--transfer of authority and responsibility:

Oncoming operating personnel shall be responsible to acquaint themselves with the equipment status and any activities under their jurisdiction before assuming the duty for the shift. As a minimum it shall include reviewing the journal entries and configuration log entries back to his last shift worked <u>or</u> back five (5) calendar days (7 days for STA's), whichever is less.

Reference: AI-5, page 4

4. Logkeeping

a. On daily (UO) journal variances:

In order to ensure that a complete record of important activities is maintained; on-shift Operations Group personnel will as a minimum enter into their journals, records of the following:

(1) Critical data, i.e. reactor coolant system (RCS) boron concentration, RCS average temperature, control rod position, power level, and time of data, unit 1 or unit 2, unit operators and Ast. SS on duty, changes covering a significant change in power level, and times at each power level, (Technical Specification (TS) 6.10. SS and unit 1 or unit 2 as applicable).

(2) Principal maintenance activities (appropriate journals dependent on work and location).

(3) Operational transients and trips (SS and applicable unit log).

Any abnormal or unusual conditions or indications experienced during the shift. Entries made in the following journals as applicable to position responsibility: SS, Switchyard operator, unit 1, unit 2, and turbine building Ast. SS.

(4) Operations within action times of TS limiting conditions for operation (LCO).

Unit 1 and unit 2 - all LCO entries shall be entered and exited on the "LCO Action Log" (AI-6 Appendix A). The 11-7 SO shall transfer all open (present) LCOs to a new LCO Action Log sheet and attach this log sheet to that dates daily journal. Significant non-routine LCO entries should be entered on the "LCO Action Log" and in the Daily Journal for purposes of review prior to assuming shift. Common routine LCOs need not be entered in both units' logs provided they are short term and the other units personnel are notified. (Examples: DGs inop for rolling, chlorine detector inop due to SI, RAD monitor blocks for Chem Lab servicing and or source check etc.)

(5) Significant equipment malfunctions.

(6) Equipment out of service for maintenance (appropriate journals as required to reflect plant activities).

(7) Any routine type operation not covered by the configuration log.

(8) Relevant information reflecting static or changing plant conditions and operation of equipment. This will include but is not limited to, operations not covered by a specific instruction. (For example, started 'A' RHR pump; stopped 'B' RHR pump.) If a specific instruction is used it will be referenced in the log. (For example, unit startup per GOI-1, 2, & 5).

(9) If an operational action is initiated and the expected response is not obtained, these unexpected responses shall be logged, as well as the problem which caused these off normal responses.

Reference: AI-6, Log Entries and Review, section 3.2, pages 2 and 3.

b. Shift Engineer (SE) preparing his log from UO's log hours after actual event:

Journals are quality assurance (QA) documents and are an important part of plant operating history; therefore, the following guideline shall be followed in their preparation and maintenance:

When possible, log entries should be made at the time the event occurs. Late entries shall be labeled as such. A separate "rough" log shall not be kept. Notes, reminders, phone numbers, etc. may be kept on note paper; however, any event to be logged shall be placed directly in the log book.

Reference: AI-6, section 3.3, page 4
AI-30, Section 10, page 9

c. Instances of late entries based on rough notes or memory:

(See b. above)

Reference: AI-6, section 3.3, page 4.

d. Supervisory review of logs not effective; e.g.

(1) SS not detecting error:

A supervisory review by the next higher classification should take place each shift to ensure good logkeeping practices are maintained.

Reference: AI-6, section 3.4, page 4, paragraph B.

(2) Time limit deficiency for timely SI review process:

An operations SI group has been established, their duties involve both timely performance and review of operations SIs.

Reference: Weekly Operations Duty Schedule (Unit Operator and AUO Classification)

e. The importance of the AUO log not being recognized by AI-6:

(1) Proper logkeeping practices and techniques required by AI-6 shall be followed by AUOs. Logs will reflect and document all major activities in the area of the assigned duty station. AUO logs will be used for information ONLY.

Reference: AI-6, section 3.0, paragraph 1 footnote.

(2) Along with the entry data requirements listed in paragraph a. above (on daily journal variances), the following additional entries are required for the AUO:

- o Gaseous and liquid release of radioactive materials (unit 1 and radwaste AUO).
- o High pressure fire protection (HPFP) equipment isolated for draining, etc. Including the time of isolation and the time of return to service.

Reference: AI-6, section 3.2, pages 2 and 3 paragraph 1.

f. On instances of failure to keep logs properly during simulator training:

All phases of simulator training will reflect real plant activities and policy as much as possible, including proper logkeeping.

5. Alarms

a. Alarms being silenced without audibly announcing the alarms:

Operators shall be alert to changes in instrument indications and alarms to detect abnormal conditions or changes in equipment performance. All alarms and abnormal indications will be acknowledged and given an adequate response in all modes of plant operation and outage configuration. Communicate actions taken, or not taken, to the other operator on the affected unit.

Reference: AI-30, section 15, page 18, paragraph B.

b. Alarms sometimes being relied on as the trigger for operator action:

Before an operator (of any classification) performs an operation he/she should plan out the expected response. After the operation (starting a RCP, turning on a pressurizer heater, etc.), the operator should look for confirmation of the expected response to all actions that were initiated, as well as over all system or unit parameters. Always be thinking and don't accept things at face value.

Reference: AI-30, section 10, page 8

c. On an AUO observing heat trace alarms and not taking appropriate action:

All alarm and abnormal indications will be acknowledged and given an adequate response in all modes of plant operation and outage configurations.

All operators shall believe their instruments, and response to these instruments' indications and annunciations as specified in instructions shall be complied with unless and until the indications are proved incorrect by a thorough investigation.

Reference: AI-30, section 10, page 9

d. On the silencing and acknowledging of alarms too slowly during simulator training sessions:

See a. and b. above. All phases of simulator training will reflect real plant activities and policy, as much as possible, including proper handling of alarms. (See ORR, section IX.E.I, page 49).

Reference: AI-30, section 10, pages 9 and 18.

6. Respect for reactivity

a. No time limit in which the ASE must review the daily shutdown margin calculation and minimum boron concentration to maintain the margin:

Sequoyah Operations Group Management attaches great importance to reactivity control. The Daily Shutdown Margin calculation will not be considered complete until the Shift Supervisor or Assistant Shift Supervisor has acknowledged and approved the results. This policy is being incorporated into SI-38, Shutdown Margin.

Reference: SI-38 Shutdown Margin

b. The RCS boron concentration was not updated on the status board in a timely manner:

The status board will be removed by February 15, 1988 since the operators use SI-38 and laboratory test results to stay aware of boron concentration. Changes to the boron concentration are always logged in the control room.

Reference: AI-6.

c. The boron meter in unit 2 was not operating and apparently has never operated:

The boron meter could never be made to operate properly because of design problems. The system engineer for the reactor coolant system will determine the feasibility of modifying or replacing the boron meter and make a recommendation to plant management prior to unit 2 cycle 4 outage.

Reference: N/A.

7. Personnel Conduct

a. Operators frequently leaned against or sat on the front of panels:

All control room activities shall be conducted in a disciplined, formal, business-like, and professional manner. The noise level in the control room will be kept at a minimum. Formality and professionalism in the conduct of shift operations shall be required. (Leaning on the bench board or control panels and/or having your back to the control board being monitored is not considered professional).

Reference: AI-30, section 15, page 18

In the control room, the RO and Balance of Plant (BOP) operator must monitor control board indications frequently and initiate prompt actions to determine the cause of and correct abnormalities. Except when required for tests or monitoring at the P-250 console, the onduty ROs or operators will be facing

their main control board controls and indications. (This guideline is not intended to interfere with normal control room functions. Its intention is to emphasize continuing cognizance of the control board status).

Reference: AI-30, section 17, page 30

b. Many operators observed not wearing dosimetry badges properly:

The use of proper radiological practices and procedures is the responsibility of all members of the plant staff. All personnel must be continously alert to the radiological aspects of the work/evolution of which they are involved.

The SS and Ast. SS are responsible for frequently inspecting their job sites and areas of responsibilities in the plant to ensure that appropriate and effective radiological procedures and controls are being utilized and that radiological deficiencies are identified and reported to radiological control supervision.

Reference: AI-30, section 10, page 13

c. Operations personnel conducting nonbusiness related discussions or working on personal business while in the turbine building office:

(1) Professional behavior must be displayed at all times whether in the control room or while conducting the duties and responsiblility of your watchstation. Operators and non-licensed operators must be alert and attentive to control indication, parameters and alarms.

Reference: AI-30, section 17, page 30

(2) Unauthorized reading material* or activities are not allowed in the MCR (or other operating plant areas). Audio and video entertainment devices shall not be permitted in the control room.

Reference: AI-30, section 15, page 18

* Unauthorized reading material is defined as that which has not been issued by TVA. Unauthorized reading material includes technical or trade magazines and publications that are not job related. SQN dispatches and Nuclear dispatches are acceptable as long as adequate control board monitoring is maintained as it will be with other job related reading activities.

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d. On periods during simulator training of reactor startup when no one observed the panels:

All personnel assigned to a simulator group shall conduct themselves as they would in actual plant conditions. The Shift Supervisor and/or Ast. SS is responsible to help the training division maintain proper conduct in the classroom and simulator. The training instructors will evaluate and critique the simulator exercise both individually and as a team response.

e. The plant going solid on the pressurizer in the one case during simulator training:

Reference: See c.1 and d above.

f. During simulator training sessions operators generally did not check to see if what they expected was what they actually got:

Before an operator performs an operation he/she should plan out the expected response. After the operation (starting a RCP, turning on a pressurizer heater, etc.) the operator should look for confirmation of the expected response to all actions that were initiated, as well as over all system or unit parameters. Always be thinking and don't accept things at face value.

EXAMPLE: If filling the VCT, monitor the level and pressure of the tank while filling operation is in progress. The operator shall be aware of approximately how long an action should take to complete by calculating a known flowrate into a known volume when filling a tank, RCS, etc.

Reference: AI-30, section 10, page 8, paragraph H.

POST IMPLEMENTATION EVALUATION

Operation Management up to and including the Assistant Manager of Nuclear Power are observing coaching and critiquing operations pesonnel. In addition, a formal Shift Operating Advisor (SOA) program defined in Administrative Instruction 50 (AI-50) was implemented January 24, 1988. Several managers who have previously been SRO licensed and who are experienced in plant operations have been assigned as SOA's for non-nuclear heatup and reactor startup. The SOAs have been indoctrinated in the new conduct of operations procedure (AI-30) and other applicable procedures. They have also familiarized themselves with the Sequoyah simulator. The SOAs will be on shift with operating crews about 16 hours each day. The SOAs will report daily to the plant manager as well as the Site Quality Manager.

The conduct of the shift crews is also being evaluated during special training sessions that address especially important areas such as criticality control. In addition, the ORR team will also conduct observations during heatup and startup.

Input from all of these sources will be evaluated by the Operations Superintendent and Plant Manager to assess the need for improvements on an individual or generic basis.

CONCERN - ORR I.B

The knowledge of plant conditions, on the part of onwatch operations personnel, appeared to be less than adequate.

RESPONSE

Knowledge of plant conditions has always been a fundamental requirement for the onwatch operations personnel. The importance of knowing plant conditions had somehow become obscured with the lengthy outage and all of the outage type work taking place.

The necessity to stay knowledgeable of plant conditions has been reinforced by management observations and special training. This requirement is also addressed more clearly in the new conduct of operations procedure (AI-30).

CURRENT POLICY

Procedural guidance for the operator:

We, as operators, must know our equipment and what is going on around us, and be able to explain and/or demonstrate this at all times.

Reference: AI-30, section 10, page 6

POST IMPLEMENTATION EVALUATION

Per AI-50, Shift Operating Advisor (SOA), the SOA will (daily) pick an operation position and ask sufficient questions to ascertain knowledge of status and/or activities associated with specific area of responsibility. Questions for which adequate responses were not obtained will be documented on the SOA daily report to the Plant Manager and the Site Quality Manager.

Unit 2 startup training on the simulator will include an evaluation of how well operators follow plant conditions. Weaknesses observed on the simulator, or onshift, by ONP Management, SQN Management and the SOAs will be addressed as appropriate. If individuals appear weak they will be given special training. Generic weaknesses will be addressed through broader based training.

CONCERN - ORR I.C

Personnel did not display conservatism and a questioning approach to essential operating information in plant operations.

RESPONSE

As a result of a corporate directive to consolidate existing conduct of operation requirements into a single instruction, on September 16, 1987, the SQN plant manager formed a joint SQN/DNT task force charged with the responsibility of developing AI-30 (Nuclear Plant Conduct of Operation) and integrating conduct of operation requirements into both student operator and license requalification training. During the development of AI-30 weaknesses found by the ORR, INPO, ANI, and others were addressed in this new instruction. Most items covered in this concern were stressed in the Conduct of Operations presentation held in November 1987.

CURRENT POLICY

Excerpts from pla procedures:

A) We, as operators, must know our equipment and what is going on around us, and be able to explain and/or demonstrate this at all times.

   Reference: AI-30, section 10, page 6

B) Before an operator (of any classification) performs an operation he/she should plan out the expected response. After the operation (starting a RCP, turning on a pressurizer heater, etc.) the operator should look for confirmation of the expected response to all actions that were initiated, as well as over all system or unit parameters. Always be thinking and don't accept things at face value.

   Example: If filling the VCT, monitor the level and pressure of the tank while filling operation is in progress. The operator shall be aware of approximately how long an action should take to complete by calculating a known flowrate into a known volume when filling a tank, RCS, etc.

   All alarm and abnormal indications will be acknowledged and given an adequate response in all modes of plant operation and outage configurations.

   All operators shall believe their instruments, and response to these instruments' indications and annunciations as specified in

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instructions shall be complied with unless and until the indications are proved incorrect by a thorough investigation. After instruments are analyzed and considered to be incorrect, they shall be identified as such and alternate means established to monitor the parameter while the instrument is suspected to be in error. In the event there is no other means to determine the value of the parameter monitored by an instrument, the most conservative value shall be assumed as a guide to the operator's response.

Reference: AI-30, section 10, pages 8 and 9

C) The Operations Group Manager will issue Daily Standing Orders (see Attachment C) to direct the operating crew, through the Shift Supervisor, to the objectives and goals that the operating crew will maintain or achieve during their assigned shift. These Standing Orders are not intended to cause any operation outside of plant procedural bounds. They will be more conservative and restrictive as a rule.

Reference: AI-30, section 10, page 10

D) Normally accessible equipment and plant spaces shall be inspected at least once each shift. Inspections will be conducted in accordance with, but are not limited to, the following criteria:

- Conditions adverse to quality[1]
- Plant spaces and equipment cleanliness
- Transient fire and seismic loading
- Industrial safety including blocked fire aisles
- Compliance with the Technical Specifications and plant instructions
- Abnormal system configuration

Reference: AI-30, section 10, page 11

E) The Assistant Unit Operator (AUO) and Auxiliary Operator (AO) within their area of responsibility will perform most of the inspection outlined in part 10.0 section 0 (D) above) of this instruction. Although this instruction directly applies to the AUO (and AO), the AUO position by its very nature requires an extra measure; that is, each AUO will be the eyes, ears, nose, and legs of the Unit Operators. The AO in turn has to be the

same for the AUO. In summary, how well the AUOs/AOs perform at each duty station(2) is very important to the operation of the plant, and will directly affect the safety, regulatory compliance, reliability, and efficiency of SQN.

Reference: AI-30, section 10, page 12

F) All activities affecting the operation of plant systems shall be performed in accordance with written instructions and paying extreme attention to detail. Before work which affects the status of any plant process equipment commences, the Shift Supervisor or his representative (i.e., Assistant Shift Supervisor (Ast. SS) - Senior Operator (SO) or the Reactor Supervisor (RO) of the affected unit) shall be notified of such work. An instruction should never be blindly followed by personnel. During performance of every instruction, personnel should be alert for conditions not covered in the instruction that could affect the safety of personnel or equipment. The wording of the instructions should match the task being performed; if it does not, change the instruction to match the action or the action to match the instruction as appropriate. When following an instruction creates a condition that could adversely affect personnel or equipment safety, normal change and revision methods (AI-4) are used. In situations where an impending emergency exists, personnel are expected to take appropriate immediate action based on their training and experience to put the plant in a safe condition and document the action taken as specified in section 12.0 of this instruction.

Reference: AI-30, section 11, page 14

G) Do not attempt any operational activity you don't feel qualified to perform. Contact the SS to resolve the concern. (This applies to all operations personnel, at all times).

Reference: AI-30, section 15, page 19

H) Ask questions pertaining to your equipment. Sometimes a small question results in a vast amount of information.

Reference: AI-30, section 16, page 22

I) If there is any doubt concerning any portion of the communication or task assigned, resolve it before taking any action.

Reference: AI-30, section 16, page 22

POST IMPLEMENTATION EVALUATION

Managers from both the Office of Nuclear Power and the site are observing the conduct of operations. In addition, AI-50, Shift Operating Advisor (SOA), establishes a position for a highly qualified manager (SRO background) to monitor the effectiveness of the implementation of AI-30 at least through unit 2 startup. The SOA makes daily reports to the Plant Manager and Site Quality Manager. These AI-50 reports along with guidance given in the body of the instruction cover the major areas of AI-30, Conduct Operations.

CONCERN - ORR I.D

A long shutdown period and considerable employee turnover, has occurred during the last two years. This will have a decided impact on individual sensitivity to plant conditions and on the ability to respond correctly to them.

RESPONSE

This concern deals primarily with the readiness of the Chemistry and Radiological Control Staff to support restart and subsequent operation.

1. Chemistry

Since mid October 1987, a significant increase in the level of intensity has been required and observed of all chemistry personnel. This has been particularly true of the shift supervisor (SE-6) positions in the laboratory, and these people have been held personally accountable for both quantity and quality of analytical results.

Each analyst is required to analyze QC check samples every other month. The results of these checks are being tabulated and trended, and when results fall outside acceptance criteria, reanalysis and/or retraining is administered.

Analytical data is being trended each day and significant perturbations are detected, evaluated, and corrected. Control charts, with acceptance limits, are used to trend data for radioanalytical equipment. Daily calibrations/performance checks are performed and reviewed in accordance with applicable procedures. These trends help to identify technician training problems, analytical equipment problems, and system chemistry problems.

During startup, emphasis will be placed on accuracy of data. Also, on-line instrumentation will be utilized extensively and this should ease the burden for chemistry personnel.

Recently, gamma spectroscopy training was performed for each radiochemical analyst. This training emphasized gamma spectroscopy results/reviews that will be required once the reactor is critical. Actual power operation gamma spectroscopy printouts were presented to each trainee during the course, and the trainee was required to review the report and identify problem areas.

Experienced Corporate Chemistry Personnel are onsite providing support to the chemistry section by observing work, coaching the plant staff, identifying procedure needs and helping solve problems. This will continue through startup.

Two ANSI qualified technicians have been assigned to each of the six chemistry shifts. To address sickness or other absences, overtime will be used as necessary to ensure that at least one ANSI qualified technician is always present on each shift.

In addition, personnel will be temporarily reassigned to ensure that each shift complement contains at least one individual with no less than three years of operating experience.

2. Radiological Control

There are at least four ANSI-qualified RADCON Technicians on each shift who have previous operating experience at Sequoyah. All of the RADCON Shift Supervisors are ANSI qualified and have operating experience.

The Radiological Control Section has several technicians who were transferred from Bellefonte during Sequoyah's present shutdown. These technicians were in a training status at the time of their transfer and completed their on the job training at Sequoyah. Consequently these individuals do not have experience in radiological control at a plant which has been recently critical. To compensate for this lack of experience, the following actions will be taken:

- In-plant drills simulating airborne problems will continue. These drills commenced on November 19, 1987.

- Training will be given to Radiological Control Technicians concerning sources of airborne contamination while at power. This training will be completed by March 3, 1988.

In response to concerns about radiological control practices during emergency situations, classroom training has been conducted for the Radiological Control Staff to define responsibilities associated with radiological control casualties (e.g., injuries, fires). An ongoing program of RADCON-specific drill training is being conducted. This program includes drills addressing injuries, fires, spills, etc. There have been nine drills conducted to date (January 22, 1988) since the ORR Team made its observations and improvements have been noted.

IP-10, Medical Emergencies, is being revised to reflect recent organizational changes; and a clarification of team member responsibilities will be included.

A site Fire Protection organization was recently established. Fire protection personnel will assume team leader responsibilities. These individuals will receive Health Physics Training as part of their qualification requirements. The ASE will be present to provide operational-type support but will no longer serve as team leader.

Technical training for the ASE involved in the drill observed by the ORR is not considered the problem. The problem was a lack of coordination between RADCON and Medical Services and inadequate leadership by the ASE. These problems are being resolved by the continued drills.

CURRENT POLICY

The Technical Specifications require that responsible plant staff members meet the qualifications of ANSI 18.1 - 1971. Personnel in the Chemistry and Radiological Control Organizations will not be allowed to perform unsupervised work unless they are ANSI qualified and qualified by training and experience on the applicable plant procedures. This is also addressed in the on-the-job training program procedure ASIL-3.

Reference: Technical Specification 6.3, Unit Staff Qualifications
ASIL-3, Orienting and Qualifying of Scientific Aides Dosimetry Aides and Health Physics Technicians for inplant work at Sequoyah Nuclear Plant.

POST IMPLEMENTATION EVALUATION

1. Chemistry

The Chemistry Manager and his subordinate managers review chemistry data and activities daily for adverse trends. In addition, representatives from the Corporate Chemistry Staff routinely review/evaluate key chemistry and radiochemistry analytical methods and results during all modes of plant operations. Periodically, these representatives observe selected chemical and radiochemical procedure performance to ensure validity.

2. Radiological Control

Management observers are observing drills and submitting written critiques to the Superintendent of Radiological Control. Drills will continue indefinitely to ensure that improvements are maintained.

All RADCON Group specific drills are reviewed and evaluated by RADCON management. Weaknesses are documented, corrective actions developed, and deficiencies are addressed in crew briefings.

Verification of the effectiveness of special training for controlling airborne contamination will also include a written examination. Acceptance criteria for the written examination will be a minimum score of 70%.

CONCERN - ORR I.E

The concept of critical self-evaluation of performance appeared to be absent from normal operations functions.

RESPONSE

A number of initiatives have been taken since the ORR concerns in this area were made available in October 1987. Special training sessions for operations personnel have focused on the lessons learned from major industrial accidents, such a Chernobyl, to build awareness of the need to view all activities critically. Tools for evaluation, such as MORT analysis are being given to the Plant Operations Review Staff and selected operations personnel in the form of training. Some actual Sequoyah plant incidents are being reanalyzed as part of this training and the participants have to formally present their findings and recommendations in the final session. Various managers from the plant staff are attending these final sessions and challenging the results of the participants. The participants have demonstrated a genuine interest in improving their evaluation skills and the feedback from this training has been good.

There is a much stronger focus on performance with the emphasis on quality as well as quantity but with clear understanding that quality is not sacrificed for quantity. Daily "Plan of the Day" meetings focus on progress on schedule items. Day to day performance as well as trends are evaluated and corrective actions taken to resolve problems. The recent emphasis has been on correction of problems preventing unit 2 restart. Performance in closing outstanding work requests, conditions adverse to quality and surveillance requirements and the closure of regulatory commitments have been tracked daily. A management by objective (MBO) programs is being developed. The performance indicators in SQA-129 Site Goals and Objectives, Sequoyah Nuclear Plant which apply to plant groups will be revised by June 1, 1988 to have plant supervisor input into the development and reporting process and to establish how they will be applied in a supervisor's management appraisal. This will be part of the plant MBO program.

Managers are now involved in evaluating drills and normal plant activities and outages and performances are improving especially in radiological control drills. Discussions with QA personnel who are observing operations personnel during the conduct of shift activities indicates a substantial improvement in the conduct of operations since similar observations during August 1987.

CURRENT POLICY

There is no one document that embodies the solution to this concern. The Assistant Manager, ONP, the Site Director and his direct reports,

including the Plant Manager and his direct reports are constantly interfacing with all levels of employees, placing great emphasis on working safely, working efficiently and working to high standards. The high standards are necessary for successful self-evaluation. These are being set in housekeeping, material condition, corrective maintenance, chemistry control, conduct of operations, conduct of PORC and correction of design inadequacies (minimization of operator actions by improving design). Formal critical self-evaluation of incidents is proceduralized in the form of root cause analysis. Formal comparison to performance indicators is in the form of the monthly performance indicator report.

Reference: Standard Practice, SQA 186, Root Cause Assessments for Adverse Actions/Conditions
Standard Practice, SQA 129, Site Goals and Objectives - Sequoyah Nuclear Plant

POST IMPLEMENTATION EVALUATION

The Assistant Manager, ONP, the Site Director, the Plant Manager, and the Operations Group Management are observing training classes. Observations of operator classroom and simulator training is on a regularly scheduled basis with at least weekly participation when training is in session. Immediate feedback is provided to the training staff and operations trainees when problems are observed.

Both corporate and site key managers will continue to review staff performance in the Plan of the Day meetings and the plant manager's staff meeting. In addition, key managers have become involved in completing root cause analysis on events to ensure that the evaluation was thorough.

AI-50 specifically requests SOAs to evaluate plant situations where critical self-evaluation might be appropriate.

Feedback from the Shift Operations Advisors as well as the other key management observers will be utilized to determine if improvements in the conduct of operations continue during startup.

CONCERN - ORR II.A

The failure to clearly define, implement, and enforce the requirements for procedural compliance could lead to operational problems.

RESPONSE

A course covering conduct of operations was developed by Westinghouse Corporation and presented to all AUOs, UOs, Ast. SSs and SSs during November, 1987. Operations personnel on loan from other TVA plants who are involved in plant operations also attended this course.

This course included a management introduction of proposed changes to AI-30. This introduction covered use and compliance with plant procedures, and the expected behavior in this area. AI-30 Revision 10 was issued for use in January of 1988.

The requirements for procedural compliance have been clearly defined through both procedures and training. Procedure noncompliances are not acceptable and disciplinary actions will be taken when necessary. However discipline will be used fairly and eautiously because it is desireable that workers report honest mistakes without fear of punishment.

CURRENT POLICY

Excerpt from plant procedure:

1. Written procedures shall be established, implemented and maintained in accordance with the requirements of Technical Specifications 6.8.1.

   The objectives of the instructions are to provide documentation and pre-determined instructions to be followed under a given set of circumstances. Each instruction is prepared to apply for an identified set of circumstances that normally exist in accomplishing a given objective. While following an instruction, the performer should utilize their training, experience, and operational abilities to procedurally accomplish the specific task. Instructions are instituted to complement the skills of the individual by providing a means of planning, organizing, and controlling his work. A review of adequate essential parameter indications should be made during the preplanning session of any plant evolution. Operation of plant process equipment shall be in accordance with approved procedures as specified in plant requirements.

   All activities affecting the operation of plant systems shall be performed in accordance with written instructions and paying extreme attention to detail. Before work which affects the status of any plant process equipment commences, the SS or his representative (i.e., Assistant Shift Supervisor (Ast. SS) - Senior Reactor Operator

(SRO) or the lead UO of the affected unit) shall be notified of such work. An instruction should never be blindly followed by personnel. During performance of every instruction, personnel should be alert for conditions not covered in the instruction that could affect the safety of personnel or equipment. The wording of the instructions should match the task being performed; if it does not, change the instruction to match the action or the action to match the instruction as appropriate. When following an instruction creates a condition that could adversely affect personnel or equipment safety, normal change and revision methods (AI-4) are used. In situations where an impending emergency exists, personnel are expected to take appropriate immediate action based on their training and experience to put the plant in a safe condition and document the action taken as specified in section 11.0 of this instruction.

SOI's are divided into Categories "A" and "B". The operator is required to have Category "A" instructions present when performing work. Category "B" SOIs are not required to be "in hand", but they shall be complied with. Detailed guidance on the use of SOI's is given in AI-4.

Reference: AI-30, page 13

2. In regards to use of a safety clearance as a procedure:

   A TVA protective tag will never be used unless it is part of an official clearance request and bears a properly assigned number. Clearance tags will not be used for any purpose other than that for which they are intended. The clearance procedure shall not be used as a substitute for, or in place of, other plant procedures.

   Reference: AI-3 Revision 38, page 2
   AI-30 Revision 10, page 11

3. In regards to an AUO checking a boron (boric acid) evaporator pump set point without the use of a procedure:

   This procedure was a Category B. Category B applies to SOIs which the operator is not required to have present during task performance. Although an SOI in Category B is not required to be "in hand," it shall be complied with. Futhermore, the operator is in no way absolved from compliance with the requirements of AI-58 regarding the maintenance of the Systems Status File and the Configuration Log, regardless of an SOI being in Category B. SOIs in Category B meet the following criteria:

   a. They do not require signoffs on a step-by-step basis, however, it is the responsibility of the individual performing the task to ensure the proper procedure (conditions for operation, precautions, prerequisites, etc.) is followed if such procedural guidance exists.

b. They are either frequently performed as a routine matter or are not especially complex procedures. They either may change a system's status (e.g., removal from service and isolation of a condensate polisher) or may not change a system's status (e.g., adjusting boron concentration of makeup to the VCT, adjusting turbine load, etc.).

Reference: AI-4 Revision 66, page 34

POST IMPLEMENTATION VERIFICATION

Feedback from supervisors walking their spaces, in-plant auditors and inspectors and the SOAs will be used to determine if procedure compliance is adequate. Incidents will be evaluated for root causes including lack of procedure compliance as a root cause.

Accuracy and completeness of Surveillance Instructions (SIs) is another indicator of attention to procedures. A review of some recently completed SIs will be conducted by document control prior to startup. If problems are indicated further corrective action as appropriate will be taken, up to and including disciplinary action if necessary.

CONCERN - ORR II.B.

The necessary positive steps to correct specific operating procedure deficiencies sometimes were not taken.

RESPONSE

A course covering conduct of operations was developed by Westinghouse Electric Corporation and presented to all operating crew members during November 1987.

A part of this course included a management introduction of the proposed changes to AI-30 and the expected behavior regarding correcting procedure deficiencies. AI-30 was issued in January 1988.

The proper actions for the circumstances observed by the ORR team have been clearly addressed in both procedures and training. Managers have been instructed in staff meetings to ensure that procedures being used in the plant do not create a trap for the user. A special project team has been formed to carry out an overall procedure improvement program with particular emphasis on operations, maintenance, and surveillance instructions. This team is currently working on maintenance and surveillance procedures and will begin work on operations procedures after the corporate writer's guide for nuclear operating instructions is issued. However, the operations group has a number of individuals dedicated to correcting technical deficiencies in operating procedures. This effort will continue until the special project team is ready to address operating instructions.

CURRENT POLICY

It is management policy to correct errors of the nature discussed in the concern. The procedure changes and training related to procedure are expected to result in procedure deficiencies being identified and corrected in a more timely manner. The following is a statement from AI-30 regarding procedure use. Operations personnel have been trained on these requirements.

> All activities affecting the operation of plant systems shall be performed in accordance with written instructions and paying extreme attention to detail. Before work which affects the status of any plant process equipment commences, the SS or his representative (i.e. Ast. SS, SO or RO of the affected unit) shall be notified of such work. An instruction should never be blindly followed by personnel. During performance of every instruction, personnel should be alert for conditions not covered in the instruction that could affect the safety of personnel or equipment. The wording of the instructions should match the task being performed; if it does not, change the instruction to match the action or the action to match the instruction as appropriate. When following an instruction creates a condition that could adversely affect personnel or equipment safety, normal change and revision methods (AI-4) are used. In situations where an impending emergency exists, personnel are expected to take appropriate immediate action based on their training and experience to put the

plant in a safe condition and document the action taken as specified in section 12.0 of this instruction.

Reference: AI-30, page 14, section 11

POST IMPLEMENTATION VERIFICATION

The evaluation of the implementation of AI-30 in all phases of plant operation will be an ongoing process throughout unit 2 startup as carried out by Management and SOA observation.

CONCERN - ORR II.C.

Management support for procedure compliance was not always evident where needed to effect necessary improvements in operator performance.

RESPONSE

The concern dealt with managements acceptance and participation in the use of operator aids, caution tags and night orders to avoid making procedure changes that should have been made.

The misuse of these operator tools is not acceptable and all operations personnel including the managers have been instructed in the necessity for using the procedure change process to change operating procedures.

The procedure change process has been simplified to facilitate correcting procedures which need correcting for any number of reasons.

CURRENT POLICY

Informal memorandums, caution tags and night orders should never be used to allow an operator to deviate from an approved procedure.

Reference: AI-30 Nuclear Plant Conduct of Operation
SQA-142 SNP - Control Panel Posted Material
AI-3 Clearance Procedure

POST IMPLEMENTATION EVALUATION

Verification of the effectiveness of these corrective actions will be accomplished through observations of management and Shift Operations Advisors in the plant during unit 2 heatup.

Acceptance critieria for the evaluation of the effectiveness is contained in AI-50 and will be based on the standards and requirements set forth in AI-30.

This evaluation of effectiveness will be done before and during unit 2 restart.

In addition, SQA 142 requires a periodic walk down of various control panels to ensure that operator aids are properly approved. The logs for operator aids and caution tags and the night orders will be reviewed prior to restart by a management representative to determine if any have been misapplied.

CONCERN - ORR III.A

The lack of adequate chemistry control results in undesirable periods of out-of-specification conditions.

RESPONSE

The responsibility for the identification and initiation of corrective action for out-of-specification conditions has been clearly defined within the Chemistry Group. Communications with unit operators, operations shift supervisors, and plant management has been improved by the use of daily chemistry trend charts for selected chemistry parameters. The trend plots serve as a means of rapidly and easily comparing chemistry data for the past seven days to administrative limits.

Significant management attention is being focused on chemistry. Systems that previously were allowed to remain out-of-specification for extended periods are now being maintained within specification except for occasional excursions. Some chemistry excursions on auxiliary systems such as the auxiliary boilers will continue due to inadequate control equipment. Corrective actions have been initiated to obtain the necessary equipment to provide good control. Chemistry excursions, even if within limits, are being reviewed to determine why they occur and prompt corrective action is initiated.

The chemistry controls on some nonplant systems such as the administration building heating systems are also being reviewed to ensure that current practices will maximize system reliability. These systems are being addressed on a lesser priority than plant systems needing attention but effective corrosion prevention programs will be in place for nonplant systems by December 31, 1988.

CURRENT POLICY

Contaminants will be controlled as low as reasonably achievable. Chemistry specifications will be established and out-of-specification conditions will be corrected as quickly as possible.

Reference: SQE-22, Sequoyah Nuclear Plant Chemistry Program (Attachment A, Tables 1-24)
TI-37, Radiochemical Laboratory Sampling and Log Sheets. (Section II, Table 1, Appendixes A and B)

POST IMPLEMENTATION EVALUATION

Verification of the effectiveness of this corrective action is provided by the trend charts now being used to monitor chemistry control (daily and monthly). These charts are reviewed daily by the Chemistry Manager

and chemistry out-of-specification conditions are reported on the Daily Plant Status Sheet for Plant systems which is reviewed by the Plant Manager. Chemistry Control is a routine topic of discussion in Staff Meetings.

These data will continue to be used as an indication of the success of these corrective actions.

CONCERN - ORR III.B

Actions to correct out-of-specification chemistry conditions are not always timely. In some circumstances, planning of operations was not adequate to assure proper control of chemistry.

RESPONSE

Much emphasis has been placed on responding effectively to out-of-specification chemistry conditions. This includes improving the sensitivity of the plant staff, including operations shift crews, to the chemistry status of significant systems. Daily chemistry trend charts are provided to the shift crews and plant management to inform them of the effects of operational activities on chemistry.

Informal training has been conducted for reactor operators and senior reactor operators to improve the communications between Chemistry and Operations shift personnel regarding proper control of chemistry. The Chemistry Shift Supervisor is now considered part of the shift crew and has unhindered access to the control room to discuss chemistry problems with the operations crew.

Administrative limits have been established for several chemistry parameters, to indicate the expected range for a particular parameter, and to initiate corrective actions prior to entering an out-of-limit condition.

Design Change Requests (DCRs) and Field Change Requests (FCRs) have been submitted to provide the necessary equipment to enhance Chemistry control and resolve longstanding chemistry problems. Also, the Chemistry Group has developed a tracking system for DCRs, FCRs and WRs that impact the quality of water in plant systems.

Improved attention to the control of chemistry is resulting in fewer out-of-specification conditions. The component cooling system and containment spray heat exchangers are examples of systems with improved chemistry control.

In some cases out-of-specification conditions maybe accepted by management for longer periods than normal. Such cases will be based upon a sound technical basis that is conservative with regard to protection of plant equipment. An example of such a situation is when Surveillance Testing of the Containment Spray Heat Exchangers causes an out-of-specification chemistry condition in the heat exchanger which may be accepted until operations can schedule the draining and refilling of the heat exchanger. If contaminants were to reach a concentration known to be detrimental to system materials, immediate actions would be taken.

Some of the problems observed with pressurizer chemistry and containment spray heat exchanger chemistry were due in large part to a lack of action on the part of chemistry management.

Some personnel changes have been made to improve this area. These changes have resulted in improved planning between operations and chemistry. Potential chemistry problems associated with planned operational activities are being evaluated and actions taken to minimize chemistry problems during restart.

It is anticipated that placing the condensate, feedwater, and mainsteam systems in service will result in chemistry excursions due to corrosion products and impurities resulting from the replacement of moisture separator reheater tube bundles and feedwater heaters. Plant management is committed to minimizing the effects of these impurities on the steam generators.

CURRENT POLICY

The plant is striving to comply with the corporate policy on chemistry control. This policy states, "Plants will focus on keeping contaminants out of systems rather than treating them after they enter and corrosion protection will be provided for all major components and systems for all phases of plant life. Chemistry specifications, action levels, and time limits for reducing power when specifications are exceeded will be predicated upon long-term availability and not short-term generation."

Reference: Office of Nuclear Policy and Organization Manual, Policy 5.8 Chemistry
SQE-22, Sequoyah Nuclear Plant Chemistry Program (Attachment A, Tables 1-24)
TI-37, Radiochemical Laboratory Sampling and Log Sheets (Section II, Table 1, Appendixes A and B)

POST IMPLEMENTATION EVALUATION

Improvements in the involvement of operations in preventing and correcting out-of-limits chemsitry will be evaluated as described under Concern - ORR III.A, Post Implementation Evaluation.

CONCERN - ORR III.C

Abnormal chemistry conditions do not receive adequate management attention.

RESPONSE

The interface between operations and chemistry groups has been significantly improved as discussed in concern - ORR III.B.

The poor condition of the laboratories is being addressed. The main laboratory has been cleaned and painted and leaks in the ceiling repaired. Additional laboratory space has been made available in the service building for radiochemistry backup counting equipment to improve the equipment environment. Management attention to chemistry has been increased as indicated by the above improvements and by the improving system chemistry control. In addition, chemistry goals will be included in the next revision of plant goals.

CURRENT POLICY

The current policy is to keep the operating shift crew and plant management aware of chemistry conditions and to address chemistry problems promptly. The corporate policy statement on chemistry is being implemented.

Reference: ONP, Policy and Organization Manual, Policy 5.8 Chemistry.

POST IMPLEMENTATION EVALUATION

The status of plant chemistry is being reviewed at least five days per week by the chemistry manager and his direct reports. The daily plant status report lists chemistry problems and is routed to other group managers and significant issues are discussed in the plant manager's staff meetings and in Plan of the Day meetings. Daily chemistry reports and management observation of laboratory activities will be used to identify areas needing additional attention.

CONCERN - ORR IV.A

The Radioactive Waste (Radwaste) System is in a temporary configuration which makes operating the system difficult and error prone.

RESPONSE

Temporary alterations (or configurations) have been reviewed for safety implications and no safety concerns exist as a result of temporary alterations to the radwaste system.

The temporary configurations to the radwaste system were reviewed and design change requests written in early 1987, to start eliminating temporary configurations. Although the actions have been approved, the money has not been made available to complete all of approved actions. A schedule for completion of the actions to remove or replace temporary alterations will be completed by June 1988.

The following are responses to specific items in the ORR report.

1. Removal of the deficient waste and auxiliary (aux) waste evaporator package.

   Comment: DCR 1106 has been approved for removal of the unused equipment. Implementation is scheduled for fiscal year 1989.

2. Removal of an 80 foot hose from the tritiated and floor drain collection systems to the Rad Demineralizer (DI) system.

   Comment: DCR 1513 has been approved for removal of this hose. Implementation is scheduled for fiscal year 1988.

3. Removal of a 200 foot hose from the condensate demineralizer waste evaporator (CDWE) to the floor drain collector tank (FDCT).

   Comment: DCR 2152 has been approved for removal of this hose. Design work is nearing completion with implementation requested for fiscal year 1988.

4. Removal of temporary alteration change form (TACF) on spent resin storage tank (SRST) and correction of the plugged SRST drain.

   Comment: DCRs 2225 and 2206 have been approved to return the system to normal configuration and correct problems. Implementation has been requested for fiscal year 1988.

5. Improve sampling techniques on evaporator concentrates to reduce solidification problems.

   Comment: Sequoyah's Chemical Engineering staff has improved the sampling procedures.

6. A review of TACF's in the radwaste treatment systems is needed to determine operability prior to startup.

   Comment: The Systems Evaluation Report process reviewed all of the outstanding TACFs (RIMS 828 870117 472).

7. Perform an independent engineering evaluation of the radwaste systems to define any needed immediate actions.

   Comment: The System Evaluation Report process (RIMS 828 870117 472) determined that no operational safety questions exist as a result of the present system configuration.

CURRENT POLICY

There is no written procedure covering this issue but the plant policy is to make permanent changes to correct system problems as fast as resources allow.

POST IMPLEMENTATION EVALUATION

Post modification testing will be conducted after all modifications to verify satisfactory completion of system changes. Each plant group is now tracking temporary alterations and each month the group manager has to report to the plant manager the status of temporary alterations and why those that remain are still needed. This includes the radioactive waste system.

CONCERN - ORR IV.B

The temporary changes in effect and the quantity of radioactive liquids involved are not providing the degree of careful and formal operations routinely needed for the radwaste system.

RESPONSE

This concern dealt with operator (AUO) knowledge of system status and the conduct of radwaste operations.

Improvements in the performance of assistant unit operators (AUO) are being addressed by changes in shift rotation and proficiency testing. The AUOs are being assigned to specific watchstations rather than rotating through all watchstations and there is a special program to recertify AUOs on the stations to which assigned. This program is in progress and will be complete prior to restart. The AUOs have been trained on procedure adherence and the need to have adequate procedures.

Sequoyah management is in the process of implementing a new water and waste processing group, within the Operations Department. This new group will provide additional management direction and expertise on operation of the radwaste treatment systems. With dedicated equipment operators, revised training programs, and experienced, dedicated, management the operation of the radwaste systems will be greatly improved. The Conduct of Operations Procedure for the Water and Waste Processing Group will be completed by June 1988.

It is anticipated the transfer of personnel, equipment and procedures will be complete by June 1988. Upgrade of training and qualifications programs and revision of operating procedures will be complete by December 31, 1989.

The temporary changes to the radwaste system were discussed in ORR IV.A.

The plant radwaste system is capable of safely handling the volume of radioactive liquid that will be generated during and after restart. The Water and Waste Processing Group will develop a water management program by December 1988. The program will provide the basis for a continuing effort to reduce liquid wastes. Even now the plant staff is sensitive to changes in the volume of liquids entering the radwaste system and investigates any significant increases. A more thorough program is needed, however; because many pipes, sumps, and tanks cannot be readily monitored to determine the source of increased flows. This will be addressed in the long term program.

CURRENT POLICY

The current policy is to minimize the amount of liquid being discharged into the radioactive waste system and to minimize the amount of radioactive material released to the environment.

Reference: ONP, Policy and Organization Manual, Policy 5.3, "Radioactive Waste Management"

AUOs are required to follow procedures, this is a written requirement that applies to radioactive waste operations as well as other areas of operation.

Reference: AI-30, Section 11, page 14.

POST IMPLEMENTATION EVALUATION

The Plant Manager is currently requiring that the status of each temporary alteration be audited periodically and a justification made as to why remaining temporary alterations should be retained.

The Water and Waste Processing Group will monitor the amount of liquid waste being processed and report this information to plant management monthly. Any large changes in the volume of liquid radwaste being processed will be investigated promptly and corrective actions taken as appropriate

The onshift activities of the AUOs are being reviewed in accordance with the post implementation evaluation activities described under Concern - ORR II.A.

CONCERN - ORR V.A

The STA is not being effectively utilized to accomplish the intended function of providing technical advice pertaining to assuring safe operation of the plant.

RESPONSE

The concern dealt with the relationship between the STA and the Shift Engineer, the STA's knowledge of the plant and the STA's actions during simulator exercise.

Since the preliminary ORR team report was issued, there have been some significant changes in the STA program.

The STA is now assigned to a specific operating crew and will rotate and train with the crew. This includes all periods of plant operation including cold shutdown and refueling. STAs will normally rotate with the crews for 12-24 months except for some STAs from the Power Operations Training Center (POTC) who may only observe a 6-month rotation.

The operating crews, including the STAs, have received "Team Concepts" training to promote teamwork within the group. STA duties have been clarified in the conduct of operations procedure (AI-30); and, as a member of the control room team, the STAs have unhindered access to all areas of the control room.

Positive actions are being taken to improve the STA position and to add incentives to attract personnel. Other actions to improve the STA position include the removal of all clerical duties which have been associated with the STA position in the past.

In order to ensure that each STA remains familiar with the onshift requirements, site instruction AI-27, Shift Technical Advisor, will be revised such that STAs who have been absent from the shift rotation for more than 12 consecutive weeks will receive an onshift familiarization period before assuming shift. The intent is to refamiliarize the STA with onshift requirements and to provide an opportunity to become familiar with plant conditions before assuming the responsibilities of shift. This will be implemented by February 19, 1988.

To provide future STAs with more intensive in plant training, AI-27 will be further revised to implement an STA walkdown program. This program shall require the STA to receive formal in-plant training on each system to be covered. Plans to implement this program are currently under development. In the interim, every effort will be made to involve operations personnel in the plant aspect of STA training.

CURRENT POLICY

1. Relations

The onshift STA is now considered a part of the operating crew and should be treated as such by everyone associated with that crew. STAs have unhindered access to all areas of the control room.

Reference: AI-27 Shift Technical Advisor
AI-30 Nuclear Plant Conduct of Operations

2. Knowledge

The current STA training program requires that each STA demonstrate adequate knowledge in systems, theory, and onshift requirements before receiving mode 1 certification. While standing shift, it is the responsibility of each STA to utilize his training to remain cognizant of plant conditions. Information, such as core burnup and pressurizer conditions (steam versus nitrogen), is required knowledge for the onshift STA.

The Sequoyah position on the STA function requires each STA to have a working knowledge of plant operations, controls, and system design basis. The STA position is not one of an additional plant operator, and significant hands-on knowledge of plant components and systems is not required.

3. Simulator Exercise Performance

STAs shall participate in requalification training with their assigned operating crew. Requalification training adequately verifies STA abilities in the performance of onshift duties.

Knowledge of the Safety Parameter Display System (SPDS) is an STA requirement, and each STA shall be familiar with the function of that system. Training shall be provided during the operator requalification course.

In addition to the above measures, STAs associated with unit 2 startup will receive special training on the SPDS before unit 2 startup. SPDS will be part of the special training being provided to each restart crew and is addressed under section VIII.b.1. All other STAs will receive this training as part of the requalification training process.

Reference: Lesson Plan OPL271C043 Systems Training, Technical Support Center Computer/Safety Parameter Display System

The STA program has been revised to assign STAs to specific operating crews which will require the STA to participate in a minimum of six

weeks of requalification each year. This will provide the STA with opportunities to perform calculations associated with reactivity changes and to obtain training for approach to criticality and power operations. In addition, SI-38, Shutdown Margin, will be revised to require the use of Inverse Count Rate Ratios (ICRR) plots to monitor approach to criticality. This will be completed by February 12, 1988.

Reference: AI-27
AI-30
SI-38

The POTC will complete a formal instruction for calculating estimated critical positions on the simulator by February 1, 1988. This additional training and formalization of calculations will improve the performance of future STAs. In the interim, experienced STAs are working onshift with less experienced STAs who are assigned to shift crews. This will continue until plant management is satisfied that the crew assigned STAs have received sufficient training and experience to serve independently as the crew STA.

AI-29, Aromatic and Ester Hydrocarbon Release Permit, has been revised such that the STA is no longer responsible for painting permits. Physi-13, Fire, has been revised such that the STA is no longer responsible for issuing and tracking fire barrier and Auxiliary Building Secondary Containment Enclosure (ABSCE) boundary breaching permits. The STA is responsible for evaluating and logging in his daily journal ABSCE boundary breaches. Formal tracking and issuing of permits are the responsibility of the Industrial Safety Group.

Reference: AI-29, Aromatic and Ester Hydrocarbon Release Permit (Painting, Cleaning and Sealing - Unit 0)
Physi-13, Fire
AI-58, Maintaining Cognizance of Operations Status - Configuration Status Control

4. Respect for Reactivity

The UO and the Assistant Shift Engineer (ASE) shall remain cognizant of core conditions at all times. Any change from the expected condition would be verified and discussed with the STA. AI-6, Log Entries and Review, requires the UOs and ASE on duty to log all changes to the RCS boron concentration.

Reference: AI-6 Log Entries and Review
SI-38 Shutdown Margin

POST IMPLEMENTATION EVALUATION

Each of the identified corrective actions will be evaluated in the following manner.

1. Relations

   The Technical Superintendent and the STA Section Supervisor will make personal observations of working relations between STAs and other shift personnel as well as obtaining feedback from SOAs and other managers on their observations relative to the STAs.

2. Knowledge

   Verification of STA knowledge will be accomplished by a management appraisal of the proficiency of crew assigned STAs. This appraisal will involve observation of the STA functioning as a part of the shift crew. This appraisal will be conducted by experienced STAs, Operations Group Managers and Managers of the STA program.

3. Simulator Exercise Performance

   Verification of the effectiveness of these corrective actions will be demonstrated by written examination and evaluation of simulator performance. All written examinations will require a minimum grade of 80%. Simulator performance will require an evaluation of each individual STA. These programs shall be implemented by unit 2 mode 2.

CONCERN - ORR VI.A

The current rotation schedule for the Assistant Unit Operators (AUOs) does not assure that an AUO assigned to a specific station has maintained satisfactory proficiency for that station from an operational familiarity standpoint.

RESPONSE

Sequoyah is implementing a special AUO watch standing proficiency certification program for startup of unit 2. Guidelines for this short term program have been issued.

To support the Sequoyah Nuclear Plant Unit Two Restart, each AUO is being assigned to a limited number of watchstations and is to be certified only on those watchstations. A long term program is being prepared.

The total number of watchstations for which AUOs must be certified is being reduced by dividing the watchstations into two groups.

A. Operations

1. Turbine Building #1
2. Turbine Building #2
3. Auxiliary Building #1
4. Auxiliary Building #2
5. Unit Control Room
6. Outside Routine

B. Water and Waste Processing

1. Radwaste
2. Condensate Demineralizer Waste Evaporator
3. Boric Acid Evaporators
4. Condensate Demineralizers
5. Makeup Water Treatment Plant

AUOs assigned to a group, either Operations or Water and Waste Processing, will be verified as qualified and will work only the watchstations within the group they are assigned.

The division of total watchstations into the two groups will reduce the number of positions the AUO is required to remain qualified on. This should allow the AUO to maintain a higher level of proficiency on the watchstations he or she is responsible for.

In the near future the water and waste water processing workstations will be formed into a separate group operated by a different classification.

AUO workstation assignments are now being tracked to ensure that no one who has been away from a workstation for greater than six months is allowed to work that station without recertifying.

CURRENT POLICY

Excerpts from plant procedures:

The Assistant Unit Operator (AUO), Candidate/Trainee is responsible for the following:

1. Ensures that each task listed on the qualification card is completed and that particular task signed off.

2. Demonstrates to his/her evaluator a degree of competence required for safe operation of the system(s).

3. Maintains his/her qualification cards.

4. Schedules examination/walkthroughs with an evaluator/supervisor in advance of the date and time of same.

   Reference: SQ OTIL-23, page 6

Qualified personnel temporarily removed from or prevented from performing operating activities for periods of greater than six months shall be requalified for their specific job duties. (1) The SS and the person requalifying shall determine the amount of retraining required on each work station. The retraining shall not exceed 5 days on any work station. The training will be documented by completing Attachment 7. Attachment 7 can also be used to document Requalification due to inadequate job performance. The requalifying person will be evaluated by at least one classification higher than himself/herself.

Reference: SQ OTIL-23, page 6

Subject: AUO POSITION TRACKING

In accordance with OTIL-23, every AUO will have worked each job station at least once every six months. This is to ensure he/she is certified to work those positions. This tracking will be done on a computer system.

Reference: Information or Temporary Instructions for the Operations Group - OSLA-30 Attachment 1 on January 23, 1988

Guidelines for the restriction of rotation of AUOs during unit 2 restart and for the determinations of satifactory qualifications for AUOs for the unit 2 restart are contained in the following reference:

Reference: Guideline for Implementation of the AUO Watchstanding Proficiency Certification Program

POST IMPLEMENTATION EVALUATION

Evaluation will be concurrent with the implementation of the Watchstanding Proficiency Certification Program.

The evaluators will be experienced plant shift managers, SRO field advisors, training personnel, and union representatives. These evaluators have been jointly selected. Attachment II is a listing of these evaluators.

The evaluator(s) will determine whether the AUO has successfully completed an assigned oral question or performance (simulated, discussion, or actual) and will so indicate on the AUO's Watchstanding Proficiency Certification Watchstation Checklist. The AUO must receive at least a 70% satisfactory score on a minimum of 15 questions per watchstation to receive an overall satisfactory for that specific watchstation. For questions concerning location, the component must be physically located and pointed out by the AUO. They must also demonstrate proficiency by performing selected portions of the OSLA-99 Workstation Checklist.

The certifications should start January 25, 1988, with Phase I to be completed prior to SQN unit 2 restart. Satisfactory evaluations will be reported to the Operations Group Manager's office on a weekly basis, and unsatisfactory evaluations on a daily basis. AUOs who receive unsatisfactory evaluations will remain at their assigned workstations and receive necessary additional training from certified AUOs. The duration of this training will be determined on a case by case basis.

The examiner(s) will identify any weaknesses and take steps to ensure the AUO's knowledge is enhanced in this/these area(s).

To aid AUOs being evaluated, study aids, i.e. qualification cards, lesson plans and AUO break-in questions will be made available at the AUO's workstation.

In the event an AUO fails in his/her first attempt on a given workstation certification, a jointly administered certification will be given on the second attempt. If the second certification exam is failed, the Local Subcommittee shall meet to determine the AUOs disposition.

CONCERN - ORR VII.A

The lack of complete and accurate information available to the operator, because of plant and/or drawing changes associated with temporary alterations, increases the possibility of operator errors.

RESPONSE

When temporary alterations are installed, control room drawings are marked up as appropriate to show the change. In addition, temporary alterations are recorded in a temporary alteration log maintained in the control room for operator review. Unit Operators and Shift Supervisors are required to periodically review the temporary alteration log.

In addition to the safety review performed prior to installation of each temporary alteration, the temporary alterations have been audited as a group on several occasions.

There is a significant effort to reduce the number of temporary alterations and the Operations Superintendent has been given specific responsibility to clear up old temporary alterations while controlling the installation of new ones.

Each group is responsible for evaluating applicable temporary alterations prior to startup to ensure they are still satisfactory for operation. Group Supervisors will have to certify to the Plant Manager that this action is complete.

CURRENT POLICY

All temporary alterations are recorded in the temporary alteration log in the control room.

Temporary alterations are now issued for specific time periods. The Plant Manager can authorize an extension if necessary but the current practice is to force a permanent solution.

Temporary alterations are recorded on control room drawings and in applicable procedures.

Reference: AI-9, page 1

POST IMPLEMENTATION EVALUATION

Prior to Mode 4, the TACF review will be signed off in the General Operating Instruction (GOI) - "Plant Startup From Cold Shutdown to Hot Standby".

Each responsible section will evaluate their TACFs and initiate a design change if appropriate.

Each responsible section has audited their TACFs to ensure they are on the proper drawings and that tags are properly placed. In the future, TACFs installed prior to November 1986 will be audited on a six month frequency while those installed after November 1986 will be audited on a three month frequency. These audits will be scheduled by the site scheduling organization. An individual reporting to the Technical Superintendent will be assigned the responsibility of closing all TACFs installed prior to November 1986. This individual will retain this responsibility until the TACFs are incorporated into the plant design or removed.

CONCERN - ORR VII.B.

The Night Orders are being employed as a substitute for preparing or changing both operating and administrative procedures.

RESPONSE

Night Orders are not to be used as substitutes for procedures. Administrative procedures have been changed to reflect this and operations personnel have been instructed not to use Night Orders as procedure substitutes.

The Plant Night Order Book has been updated by removing outdated night orders.

CURRENT POLICY

Night Orders are used to provide administrative guidance to ensure all operation groups are informed of special requirements, as specified by operations managers.

Night Orders will not be used to operate plant safety related equipment in a manner contrary to approved plant procedures (i.e., operating instructions will be revised prior to issuance of Night Orders.)

Night Orders will not be used for altering the as-constructed configuration of safety-relat[illegible] [illegible]ant equipment.

Night Orders will not be [illegible] the controlling or tracking of plant equipment for fulfilling a s[illegible]llance requirement.

Reference: Operations Section Letter (Administrative) #30 (OSLA 30), page 1

POST IMPLEMENTATION EVALUATION

AI-50, Shift Operations Advisor (SOA), establishes a program for highly qualified managers with an SRO background to monitor the effectiveness of the implementation of AI-30 at least through unit 2 startup. The SOA makes daily reports to the plant manager and site quality manager concerning the major areas of AI-30, Conduct of Operations. AI-30 directs the user to the appropriate instruction on the Night Order Book (OSLA-30). Its guidance will be used by the SOA in the evaluation of this area.

CONCERN - ORR VII.C

Operator aid postings are being used in lieu of caution or hold tags and procedure revisions. Deficiencies previously identified by the Institute for Nuclear Power Operations (INPO) had not been corrected.

RESPONSE

SQA-142 was revised to address the concerns identified by the ORR team and to make the procedure conform to the INPO guidelines for use of operator aids. Operator aids are not to be used as caution tags and the procedure specifically asks the SS to evaluate each request for an operator aid to determine if a caution tag would be more appropriate.

CURRENT POLICY

The Shift Supervisor (SS-SO) will review each Operator Aid proposed to be posted and shall signify his approval by completing the Operator Aid Log Index (see Attachment A) and by signing, dating, and placing the sequential serial number from the log on the operator aid. During this review the following will be considered:

1. Is the aid part of an approved procedure? If it is not part of an approved procedure, an evaluation will be made to determine if it should be, and a revision initiated as necessary.

2. Does it agree with existing instructions on the system?

3. Would a caution order be more suited to the given situation?

   Reference: SQA 142 Revision 7, page 3 and 4.

POST IMPLEMENTATION EVALUATION

Operations section management personnel will audit the use of operator aids for correctness as described in SQA 142. This audit will be completed by February 23, 1988. Any discrepancies found during this audit will be immediately corrected. If a programmatic problem is discovered, a corrective action will be determined based on the root cause. Corrective action, including training, disciplinary action or other actions will be taken as appropriate.

The SS and SOA will continue to evaluate the implementation of SQA-142.

CONCERN - ORR VII.D

The safety of personnel and protection of equipment is not fully assured by the current use of tag outs.

RESPONSE

The concern addresses a lack of attention to detail in the conduct of safety tagout, in misapplication of the tagout procedure and with the content of the clearance procedure (AI-3).

Attention to detail in procedure utilization has been stressed in procedure changes and related training sessions. Use of the clearance procedure (AI-3) is emphasized in annual operator requalification training and adherence to procedures in general has been stressed to all operation personnel.

To improve control of the clearance process, a "tagging crew" is being formed to perform the majority of tagouts. In addition, AI-3 Clearance Procedure has been revised to state that a caution order will not be used as a clearance boundary or in-plant for protection and safety of personnel.

The procedure content regarding mechanical boundaries is adequate for establishing a safe mechanical working clearance. Even though single isolation is used, the piping is verified to be depressurized before the clearance is issued unless the work package instructs the worker to depressurize the system. Normally a vent or drain is tagged open to demonstrate the system is depressurized.

The tagging crew, the Shift Supervisors and Assistant Shift Supervisors will be directed to take extra steps when possible to mitigate the potential for leaks or spills when using single valve isolation. For example, if work is proceeding between two valves, the pressure on both sides of the valves should be reduced to the extent possible in case the valve leaks through. This will be conveyed via night orders to the operations personnel and tagging crew respectively. A permanent reminder will be added to AI-3 by June 1, 1988.

Sequoyah believes the clearance procedure is adequate and will place continued emphasis on its proper implementation.

CURRENT POLICY

Strict adherence to the clearance procedure (AI-3) is a requirement.
Reference: AI-30, Conduct of Nuclear Plant Operations
AI-3, Clearance Procedure

POST IMPLEMENTATION EVALUATION

The ONP and Site Management as well as the SOA's will monitor and evaluate the implementation of the clearance procedure by direct observation.

CONCERN - ORR VII.E.

Current independent verification practice doesn't fully assure the valve and electrical lineups are correct for the intended operations.

RESPONSE

This concern addresses the lack of independence in the second party verification process and the fact that some alignment check sheets may not include all valves.

Although the present method of second party verification is adequate, based on the recent implementation of AI-58, total independence of the parties to a two party verification would eliminate the potential influence of the parties on each other. As a result, complete separation of independent verifiers will be implemented by June 1, 1988.

AI-37 will be changed to reflect the complete separation of independent verifiers by June 1, 1988. This Sequoyah Policy change will also be shown in other appropriate plant procedures, i.e., AI-3, AI-58, AI-30, etc.

With regard to valves not included on valve lineup checklists, the following guidelines apply. Valves that are not on the checklist are in the body of a category "A" SOI. These are valves that are frequently manipulated, i.e. Chemical additions valves to the CVCS, whose positions are controlled and independently verified within the instruction.

OSLA-107 will be performed on all SOIs to identify procedure and drawing deficiencies. OSLA-107 is the procedure used by operations to verify and validate SOIs.

CURRENT POLICY

1. Independent verification is the determination made by two appropriately qualified individuals, operating independently, that a required action has been accomplished as specified. It shall be stressed that when traveling together each individual must verify the action. Effective June 1, 1988 independent verifiers will not be allowed to travel together.

   Reference: AI-37

2. SOIs will be validated in accordance with OSLA-107.

   Reference: OSLA-107, page 2

POST IMPLEMENTATION EVALUATION

Because of problems with the initial valve lineups for entry to mode 4 a significant effort went into strengthening the valve alignment procedure. Management inspections and observation tours were utilized to evaluate and ensure proper application of the valve alignment procedure. In addition, NRC Inspection 87-66 observed the revised system alignment process to include independent verification and determined that the process was satisfactory and the QA organization has audited the revised system alignment process and found it to be satisfactory.

For heatup and startup the SOAs will monitor shift activities and pay close attention to valve lineups to determine if operators are following procedures and maintaining independence during two party verification.

CONCERN - ORR VIII.A

An understanding and working knowledge of core reactivity changes resulting from various activities were lacking.

RESPONSE

For operations personnel, the Division of Nuclear Training will include in special startup training sessions both classroom and simulator instruction on core reactivity. These classes and exercises will include the following specific topics recommended by the Institute of Nuclear Power Operations.

1. Rod Control

2. Reactivity Effects

3. Shutdown Margin

4. Use of count rate doubling

5. Plant response during normal loading and unloading of generator

6. Communications in adequate depth and scope

These classes commenced on February 1, 1988 and all operating crews will receive this training prior to unit 2 startup.

While these topics are already in the operator training curriculum they have been singled out for special startup training because of their significance and the fact that operators have not had to actively use this knowledge for the past 30 months.

For chemistry personnel, special training materials will be prepared by the Division of Nuclear Training concerning the basics of core reactivity and how it is affected by chemistry control. This material will be reviewed with all Chemistry Personnel in a short seminar format. The review sessions will be completed by February 15, 1988.

CURRENT POLICY

The licensed operators are expected to know and understand the effect on core reactivity of any activity performed on the plant. This is required by 10 CFR 55.21.

The operator training program includes the topics above (Response).

Reference: Lesson Plan OPL271COOL - Reactor Theory, Operator Applications VI.
Area Plan 0202.05, Training Program Attachment 8.1 page 133

Chemistry personnel are expected to know the concept of reactivity control and the effect of chemistry activities on the reactivity.

Reference: Radiochem Lab Analyst Training Lesson Plans CHM003.007 (pages 93, 94), CHM003.029 (pages 4, 5), CHM003.025 (pages 11, 18, 20, 24)

POST IMPLEMENTATION EVALUATION

1. Operations verification of the effectiveness of this corrective action will be accomplished by written examination and evaluation of simulator performance.

   Acceptance criteria for the written examination will be a minimum score of 80%.

   Acceptance criteria for the simulator evaluation will be overall satisfactory performance in the areas identified on the Observation Guide of the simulator exercise guides.

   Verification of this action will be completed for each crew at the conclusion of the training session prior to unit 2 startup.

2. Chemistry verification of the effectiveness of this corrective action will be accomplished by written examination.

   Acceptance criteria will be a minimum score of 70%.

CONCERN - ORR VIII.B

A lack of complete familiarity and appreciation for the capability of the Safety Parameter Display System (SPDS) was evident.

RESPONSE

The Division of Nuclear Training will include in the special startup training sessions both classroom and simulator instruction on the use of the SPDS. These classes and exercises will include the purpose, use and recent modifications of the SPDS.

These classes will commence in the first week of February 1988 and all startup operating crews will receive this training prior to unit 2 startup. The remainder of licensed personnel, including STAs, will receive the SPDS training in week 2 requalification training.

CURRENT POLICY

Licensed operators shall be able to describe and use the primary functions of the SPDS and the critical safety function status trees.

Reference: Lesson Plan OPL271C043 - Systems Training, Technical Support Center Computer/Safety Parameter Display System

Area Plan 0202.05 Training, Attachment C.1 page 133

POST IMPLEMENTATION EVALUATION

Knowledge of the SPDS will be verified for each crew prior to unit 2 startup by written examination and evaluation of simulator performance.

Acceptance criteria for the written examination will be a minimum score of 80%. Acceptance criteria for the simulator evaluation will be overall satisfactory performance in the areas identified on the Observation Guide of the simulator exercise guides. Weaknesses will be addressed on an individual or crew basis as necessary.

CONCERN - ORR IX.A

The operating crews did not show uniformly good skills in diagnosing plant problems.

RESPONSE

Special startup training sessions, both classroom and simulator instruction, on diagnostic skills have been completed for unit 2 startup crews. The classroom instruction was integrated into a session entitled "Teamwork and Communication" while the simulator instruction was integrated into all simulator exercises.

These classes commenced during the first week of February 1988 and all operating crews assigned to unit 2 completed this training as of February 19, 1988.

The long term actions specified in response to Concern - ORR IX.C and Recommendation - INPO IV.C.2 will result in improved diagnostic skills of the operating crews.

CURRENT POLICY

N/A

POST IMPLEMENTATION EVALUATION

For special startup training, verification of this action was completed for each crew at the conclusion of the training session. For operating crews assigned to unit 2, verification was completed as of February 19, 1988. All crews and individuals completed this training with satisfactory performances.

For long term corrective action evaluation refer to Concern - ORR IX.C and Recommendation - INPO IV.C.2.

CONCERN - ORR IX.B

Insufficient time is being allocated each year for maintenance personnel retraining. The lack of sufficient numbers of skilled craftsmen to perform maintenance in some specialized areas is of special concern.

RESPONSE

Sequoyah Nuclear Plant (SQN) maintenance supervisors have initiated or planned the following actions:

1. Courses identified in the Maintenance Planner Training curriculum have been developed and the training program will be started by March 31, 1988. Schedules are being coordinated to ensure all incumbent planners complete the formal Maintenance Planner Training program by July 1, 1988.

2. Training schedules for the first half of 1988 have been established for the electrical, instrument, and mechanical maintenance groups. These schedules provide for an increase in technical training that is conducted for maintenance personnel. Training needs for the last six months of 1988 are being assessed with a goal of finalizing training schedules by April 1, 1988.

3. Training in specialized areas, identified in the Operational Readiness Review Report will be conducted to ensure sufficient numbers of skilled craftsmen are available to perform specialized maintenance activities. Two specialized courses in the emergency diesel generator (EDG) area were presented in February of 1988. Course MTE238, Woodward 2301 Reverse Acting Tandem Governor System, was conducted February 16 through February 22, and Course MTE247, Emergency Diesel Generator Voltage Regulator, was conducted February 23 through February 24. These courses should provide the necessary knowledge and skills for selected electricians to perform assigned duties in the EDG maintenance area. As prerequisites to in-depth training on annunciator circuitry and related drawing, four (4) electricians completed courses on the use of oscilloscopes in December of 1987. These four electricians also completed a solid state electronics course and a 40-hour Annunciator Maintenance course on January 27, 1988. This course provides extensive coverage of TVA and vendor prints used to perform work on the alarm annunciator system. Another presentation of the Annunciator Maintenance classes will be conducted in April and additional classes in this area will be scheduled as needed.

4. Valving out a differential pressure (d/p) unit is considered to be within the skill of the craft in instrumentation. The sequence of properly valving out a d/p unit is thoroughly covered in the instrumentation training program. The instrument maintenance craft

personnel will be reminded of the proper sequence for valving out a differential pressure instrument by documenting a required reading notice that describes the ORR concern and reiterates the proper sequence for valving out a d/p cell.

5. Instrument Maintenance craft personnel will be reminded of the proper method of connecting a water box to a differential pressure unit by documenting a required reading notice that describes the ORR concern and reiterating the proper connection guidelines.

6. The plant procedure covering common mode failures will be discussed with the instrument maintenance craft personnel by each foreman in a documented crew safety meeting.

CURRENT POLICY

A continuing training program for electrical and mechanical maintenance craftsmen shall be developed and administered for each plant site. Course content and length may vary in response to plant needs. Continuing training should address plant changes which could affect the performance of assigned duties and improve job performance through broader scope and depth of job-related knowledge and skills.

Reference: PMP 0202.08, Electrical and Mechanical Maintenance Craftsmen Training Program, section 6.1.1.3 and 6.2.1.3

The DNT Technical and Craft Training Section Supervisor shall ensure a training program is implemented at SQN as required by PMP 0202.08. The Technical and Craft Training Section Supervisor is responsible for training requests from the SQN maintenance superintendent and shall provide formal classroom training to support electrical and mechanical maintenance craftsmen training at SQN.

Reference: SQN AI-14, appendix I, page 2

The SQN maintenance superintendent shall identify to the DNT any need to revise existing training or to develop new training to meet plant identified training needs. He shall ensure that training is scheduled and conducted at SQN to meet the requirements of PMP 0202.08.

Reference: SQN AI-14, appendix I, page 2

Each maintenance group supervisor shall be responsible for the overall training program for his group. He shall publish a detailed section instruction letter to define the training program for that group. He shall determine the number of individuals to be trained and qualified in each duty area.

Reference: SQN AI-14, appendix I, page 2

A continuing training program has been established for all annual craft personnel. This program is designed to maintain and improve the skills and knowledge of the participants. Continuing training consists of systems retraining, selected courses from the electrical update and mechanical update training curriculum, and training based on significant industry and operating experience.

Reference: SQN AI-14, appendix I, page 3

POST IMPLEMENTATION EVALUATION

SQN maintenance group supervisors will increase their review of maintenance training program activities as follows:

1. Maintenance group supervisors will approve each six month training schedule for maintenance craft personnel. They will review weekly activity reports to ensure timely assessment of training progress during scheduled training. The need for specialized training will be assessed during the schedule approval process.

2. At the end of each calendar quarter, maintenance group supervisors will review cumulative training hours for technical and administrative training to ensure that sufficient emphasis and attention is being applied to technical training needs.

3. The group supervisor will ensure that all instrument maintenance craft personnel complete the required reading notices on the sequence of properly valving out a d/p unit and on the proper methods of connecting a water box to a d/p unit before March 11, 1988.

4. The group supervisor will ensure that all instrument maintenance craft foremen have completed the required briefing on plant procedures covering common mode failures before April 15, 1988.

CONCERN - ORR IX.C

Certain key features appear to be missing from the program used to assure that requalification training is focused toward areas of greater need.

RESPONSE

In response to findings from a previous evaluation of the Division of Nuclear Training (DNT), conducted at the direction of the Manager, ONP, the DNT has established and staffed an internal assessment unit whose primary function is to evaluate the effectiveness of training activities. In addition, the Operator Training Branch has established and staffed two positions for operations evaluators. The responsibilities of these individuals include assessment of performance of operations personnel in the field, reviewing appropriate plant documents (eg. PROs, LERs, etc.) for identification of adverse trends and obtaining feedback from site management regarding the effectiveness of training.

Further, analysis of the performance of each crew will be performed to identify specific crew training needs.

SQ-OTIL-1 will be revised to require the following:

1. Formal analysis of the NRC type requalification examination results to identify training needs.

2. Formal review of operating crew performance to identify specific training needs.

3. Improved documentation of the basis for requalification topic selection.

4. Input from the operations evaluators based on their performance assessments.

SQ-OTIL-1 will be revised by June 30, 1988.

CURRENT POLICY

Specific topics to be covered in requalification training shall be selected during semi-annual meetings between the plant training group head, engineering supervisor (for STAs), engineering training supervisor, operations group head, and applicable simulator staff. In addition to identification of training needs by the plant staff and DNT staff, selection of topics shall be accomplished using the general guidance offered by regulatory documents, pertinent industry current events, vendor bulletins, plant modifications, licensee feedback from the previous year, and by a review of past training records to determine indications of difficulty.

Reference: PMP 0202.05, page 115, paragraph 6.3.7.4, implemented by SQ-OTIL-1

POST IMPLEMENTATION EVALUATION

Managers from the Operations Training Branch will review the implementation of the revised SQ-OTIL-1 requirements at the next semi-annual meeting. This review will consider whether the logic and rationale for topic selection supports the topics selected.

Post implementation verification will be completed by July 31, 1988.

CONCERN - ORR II.D

The conduct and evaluation of simulator exercises do not take full advantage of the training environment opportunity to instill proper standards of operation.

RESPONSE

Simulator exercise guides have been developed. Included is an observation guide which was developed from an INPO supplied guide. This observation guide includes the evaluation of standards of conduct addressed in AI-30. This observation guide will be used by the simulator instructor to ensure that the standards of conduct are being met in the simulator. In addition an operations training instruction letter (OTIL) will be developed by June 30, 1988 to establish general rules of conduct and standards to be used in conducting simulator sessions.

This OTIL will help the simulator instructor relate the standards of conduct in AI-30 to the simulator Observation Guide. Additionally, this OTIL will establish a requirement to use two instructors during requalification simulator sessions, whenever possible, to ensure adequate observation of individual trainee performance.

For the long term, a simulator instructor training program is being developed. This training program will stress that the standards of conduct for simulator sessions be the same as for the plant control room and will cover the requirements of AI-30.

CURRENT POLICY

The conduct of simulator training will to the extent possible reflect the standards required in plant control room activities.

POST IMPLEMENTATION EVALUATION

Verification of the effectiveness of the short term actions will be accomplished by satisfactory performance of the operating crews in the evaluations conducted by operations management identified in responses to Section I of the ORR report.

The effectiveness of this corrective action will be verified by review of the evaluation sheets completed subsequent to issuance of the OTIL.

The criteria for review will be whether the evaluation sheets are documenting good performance and/or poor performance in the areas covered by AI-30.

This review will be completed by July 31, 1988.

CONCERN - ORR IX.E

The simulator training situation did not always correspond to a real plant situation.

RESPONSE

The areas identified in the basis section of the report for this concern can be separated into two distinct areas. These are (1) hardware and software configuration and (2) realism in the conduct of simulator sessions.

Corrective action for each of these two areas will be dealt with individually.

1. Hardware and software configuration

   NRC generic letter 87-07 and 10CFR55.45 require each nuclear facility to certify to the NRC that the simulator to be used for operator testing is an accurate representation and model of the reference plant.

   The certification process requires documented performance testing, configuration studies and a formal retesting program.

   In September 1987, TVA completed an Action Plan Study identifying the efforts necessary to complete the certification process. This study also establishes target schedules to meet the time frame required by the rule revision. April 1989 is the target date for certification of the SQN simulator.

2. Realism in the conduct of simulator sessions

   The actions identified for item IX.D will resolve the conduct issues identified by the report.

CURRENT POLICY

The manager, SSG, shall be responsible for ensuring that the simulator provides the realism needed (1) to maintain certification of the program

and (2) to be compatible with guidelines established by NRC and/or the nuclear industry (ANSI/ANS 3.5).

Reference: Area Plan 0205.01, section 3.1.4
Standard Practice TCM3

POST IMPLEMENTATION EVALUATION

Verification of the effectiveness of this corrective action will be accomplished by simulator certification submitted to NRC.

CONCERN - ORR IX.F

Simulator training is not being used to the maximum potential to document the need for design or procedure changes in the plant.

RESPONSE

SQ OTIL-14 has been revised to include collection of feedback pertaining to potential plant design changes and procedure improvements identified during simulator training.

The specific concern regarding the procedural requirement to stop the containment spray pumps while switching suctions was evaluated and it was determined that this step was necessary to meet the design criteria of the system and avoid potential pump damage.

Emergency Contingency Action (ECA) procedures 3.1 and 3.2 have been issued to address a steam generator tube rupture in combination with a LOCA. These procedures are being presented in training as described in response to INPO item IV.A.4.

The specific concern regarding the problem with establishing flow through the pressurizer has been determined to be a simulator difference from the plant. DCR S388 has been submitted to correct this situation.

To address the specific concern on steam dump valve cycling an evaluation will be performed to determine if the cycling and duration is, in fact, detrimental to the valves. This will be completed by the Technical Support Department approximately one month after achieving full power operation.

CURRENT POLICY

SQ OTIL-14 requires that problems indicated during simulator performance be evaluated to determine if they represent procedure or hardware problems in the plant.

Reference: SQ OTIL-14, revision 7, page 1

POST IMPLEMENTATION EVALUATION

Verification of the effectiveness of this corrective action has been accomplished by determining that the feedback form is now in use.

CONCERN - ORR X.A

The Radiological Control Program exhibited areas of weakness that require continuing managerial attention.

RESPONSE

The specific concerns covered in the ORR basis section for concern X.A warrant specific replies. These concerns are repeated below and followed by the response.

Concern 2.a

The attitude of radiological control technicians does not support good control of radiological work. They are reluctant to stop poor work practices. They tend to wait for outsiders to identify radiological problems. They are not fixing problems promptly and are not reacting aggressively to near misses. They have been accepting status as second class personnel.

Response

These issues have been addressed in several Radcon section meetings. Radcon management has clarified the responsibilities of the technicians in regards to work stoppage and the importance of identifying and correcting radiological problems in a timely manner.

Guidelines for notifying senior Radcon management of significant radiological control conditions were issued in a standing order on November 6, 1987. This will ensure better participation by Radcon management in solving nonroutine problems.

There is clear management support of the Radiological Control Program and this support has been demonstrated when Radiological Control personnel exercise their authority to control or stop work.

Observations are conducted on a routine basis to ensure that Radcon personnel are identifying and fixing radiological problems. Radcon technicians and first line supervisors have been accompanied on a number of jobs by senior Radiological Control managers to ensure that acceptable radiological control practices are identified.

Concern 2.b

The attitude of the work force appears to be that radiological control is a necessary evil, not an integral part of their job, and is basically the responsibility of the radiological control organization.

Response

ALARA training has been provided to foreman-level employees emphasizing the importance of integrating radiological control practices in their everyday duties. This training is continuing.

The necessity for all sections to assume their radiological control responsibilities, has been conveyed to the senior managers onsite. This message is being reinforced by stopping work when radiological work practices, including housekeeping, are not satisfactory.

Concern 2.c

Training of radiological control technicians and their foreman does not impart sufficient technical knowledge and does not ensure these personnel can handle unusual situations. For example, they do not understand the fixed radiation monitors. The extra training time available in a six-shift rotation is not planned as is done for others who need large amounts of training. Oral examinations do not address the ability to handle unusual situations, they are not given to foremen, and they are not repeated periodically for requalification.

Response

Additional training is planned for 1988, with a goal of one week of training per quarter. The training schedule to accomplish this has been issued.

The six-shift rotation schedule can not be supported at this time. The need for a "six-shift" rotation will be evaluated by March 18, 1988 and recommendations made based upon technician staffing levels and availability of training resources.

The need for the type, scope and method of conducting oral examinations will be evaluated by Radiological Control Management. This issue will be discussed at the next TVA-wide RPM meeting scheduled to be held in March. The implementation of oral examinations will require supporting procedures and a consistent TVA-wide program. A decision regarding the use of oral examinations will be made by April 22, 1988.

Concern 2.d

Radiation workers have not received sufficient training in the practical aspects of their radiological work. Numerous examples of poor work practices have been observed.

Response

Sequoyah will implement an advanced Radiation Worker Training course. The scheduled implementation date is October 1, 1988. This course will be approximately 40 hours in length and will include, as a minimum the following topics:

1. Contamination Control Techniques

2. Respiratory Protection

3. Principles of Radiation Protection/ALARA

4. Biological Effects

5. Protective Clothing and Equipment

This training will be presented to permanent plant radiation workers.

Concern 2.e

Radiological Control personnel are not sufficiently sensitive to their responsibilities to minimize unwarranted injury claims in such basic areas as keeping good logs.

Response

Radiological Control personnel will receive refresher training in how to minimize unwarranted injury claims and the importance of maintaining good records. This training will commence in February 1988, and shall be completed prior to March 31, 1988.

Concern 2.f

Poor cooperation among radiological control, chemistry, and radioactive waste organizations contributes to radiological problems going unresolved.

Response

The Superintendent of Radiological Control, the Water and Waste Processing Supervisor and the Chemistry Group Supervisor now participate in interdepartmental coordination meetings. These meetings may be discontinued after the working relationships reach the desired level of performance in routine activities.

The first meeting was held on January 26, 1988.

Concern 2.g

Support of the radiological control program is particularly weak in the nuclear engineering and the modifications organizations.

Response

ONP ALARA Standard ONP-STD-5.7.6 has been approved. This standard provides detailed radiological control requirements for the Engineering and Modification Organizations and assigns specific responsibilities for incorporating ALARA principles into design and modification work. Additionally, an ALARA Engineer from the site department was assigned to the Division of Nuclear Engineering (DNE) on November 23, 1987 to provide assistance and support to DNE in the radiological controls area. The primary function of this position is to ensure early incorporation of ALARA engineering controls into new designs or design changes. The Division of Nuclear Engineering has also committed to filling two (2) site engineering positions by August 1988 to further provide ALARA engineering into all aspects of DNE work.

As of April 30, 1987, the site RADCON ALARA Section began reviews of all Design Change Requests (DCRS) and all work plans requiring access to the radiological control area (RCA). Since the work plan is the major work controlling document for modifications and is a direct result of the design document issued from DNE, and with the additional procedure guidelines and engineering support for ALARA, support of the RADCON program within engineering and modifications will improve.

Concern 2.h

There is no organized program to control the radiation source term which causes the bulk of the radiation exposure to workers.

Response

Sequoyah's Chemistry group has implemented a chemistry control program for the purpose of improving overall plant protection and to minimize source term buildup. The following steps have been taken to address this issue and are currently in progress

1. Improvement in trending crud levels and coolant activity.

2. Correlating chemistry trends including radioactive materials in the coolant with operating activities.

3. Increased attention to management of CVCS mixed bed demineralizer operations.

4. Enhanced control of RCS parameters during startup and operation (e.g., maintain constant pH by operating in the Li-B coordination band, maintain control of RCS dissolved oxygen levels, and maintaining hydrogen concentration near the lower limit of 25 cc/kg).

The Chemistry Group will, as a continuing effort, collect more industry information on RCS chemistry control and evaluate alternate chemistry control schemes to minimize radiation level buildup.

The Radiological Protection Staff will revise HPSIL-21, Reactor Coolant System Monitoring Program, to establish a more detailed trending system for radiation level buildup. This procedure will be revised by April 15, 1988.

The Radiological Protection Staff will coordinate the revision of the RCS cleanliness control program procedures to ensure that adequate administrative controls are established when system components are opened to prevent the entry of foreign matter into plant systems. This effort will be completed by April 15, 1988.

Concern 2.i

The radiological assessor position under the site director is vacant. Without this key person, management attention has not focused on the parts of the radiological control program outside the radiological control organization.

Response

The site's radiological assessor position is presently being filled on a temporary, part-time basis, by a member of the corporate Radiological Control group.

The site director is currently pursuing candidates to fill this position on a permanent basis.

Concern 2.j

Contamination control practices are sloppy. Radioactive leaks are not identified and repaired promptly. Temporary hoses continue to be used for long-term service, increasing the risk of leaks. Equipment to control radioactivity widely used in good contamination control programs elsewhere is not in use.

Response

Contamination control devices and equipment have been purchased and received. A procedure describing the use of these devices has been issued and this equipment is in use.

Contamination control practices will be addressed in the advanced radiation worker training course addressed under paragraph d.

Radioactive leaks are identified on a continual basis and tracked by work requests. Leaks contributing to the spread of contamination are placed on a priority repair list.

Temporary hoses being utilized for long term service have been identified and modifications to replace these hoses are being submitted. All necessary design changes will be submitted by April 1, 1988.

Concern 2.k

Personnel leaving the plant are not required to pass through an operating portal radiation monitor. The purpose of a portal monitor is to increase the assurance of successful control of radioactive contamination within the plant.

Response

Three portal monitors have been transferred from Watts Bar Nuclear Plant to Sequoyah. The main gate house is being modified to house these monitors. The monitors will be operational by April 4, 1988.

Concern 2.l

Most radiological control personnel lack recent experience in an operating plant. Extra efforts to compensate for this situation have not been planned.

Response

Because of Sequoyah's previous operating history, the systems expected to be contaminated as a result of operation are already contaminated and the current technicians are familiar with outage type radiological controls. Since actual plant operation will result in higher radiation levels, and the presence of noble gases, and radioactive iodine in air samples, and water samples, drills have been instituted to prepared personnel to handle both routine and unusual situations, especially involving airborne contamination. These drills commenced at the rate of one per week in November 1987 and are continuing. In addition, each crew is headed by a shift supervisor who has operational plant experience and at least four technicians on each crew have operational plant experience.

Concern 2.m

Over 3000 personnel are being monitored for radiation at the station. Efforts to make major reductions in this number are not apparent, although such reductions have been successful elsewhere. Where used, these allowed better training, supervision, and radiological control coverage of the smaller radiation work force.

Response

Reading the Sequoyah units for restart has required the support of a large number of permanent and temporary employees. Significant reductions in work force are expected after unit 1 restart. Plant management is keenly aware of this situation and improvements in planning, scheduling, and modification control will help control the number of badged employees in the future.

CURRENT POLICY

Radiological Control practices for Sequoyah are described in Radiological Control Instruction (RCI)-1 which is taught in general employee training. Every radiation worker must take this training at Sequoyah or document that they have received equivalent training elsewhere and pass a test to indicate they have the basic knowledge required of radiation workers. Radiological control technicians are expected to enforce prescribed radiological work practices and have stop work authority in imminent danger situations.

Reference: RCI-1 Radiological Control Program

POST IMPLEMENTATION EVALUATION

The monitoring of in-plant radiological control practices will be accomplished as stated in the response to INPO Recommendation IV.D.1.

The Radiological Control Superintendent will track the other issues until they are incorporated into the radiological control program.

CONCERN - ORR XI.A

Dedication of extra resources to compensate for the existing maintenance program inadequacies may not be maintained after startup or be adequate for the new plant modes. This could adversely impact safe and reliable operations.

RESPONSE

Sequoyah has taken or will take the following steps to ensure that a maintenance program is in place after restart that will not adversely impact safe and reliable operations.

1. Inspections

   a. Training will be developed for Systems Engineers on the proper performance of a system walkdown. This training will provide the Systems Engineer the knowledge required to evaluate the performance of a system, and to identify any system material deficiencies. This training is scheduled to start June 1, 1988.

   b. An evaluation of all systems will be made to determine the frequency for performing system walkdowns required to ensure system reliability. The frequency requirements will be determined based on equipment failure data and other experience and data obtained from conducting walkdowns. These walkdowns are currently in progress.

2. Planning

   To improve the quality of planned work packages.

   a. Courses identified in the Maintenance Planner Training Curriculum have been developed and the training program will be started by March 31, 1988. Schedules are being coordinated to ensure all incumbent planners complete the training program by July 1, 1988.

   b. Increased management attention is being given to the completion of planned packages prior to sending them to the field for work.

   c. Additional resources are being provided for handling administrative requirements in order to allow planners more time to plan work packages.

   d. The complexity of work packages is being reduced by simplifying maintenance instructions and reducing administrative requirements.

   e. A Plant Operations Impact Evaluation Program has been implemented to ensure that the impact on plant operations, of each work package is thoroughly understood before it is released for work.

3. Schedule

A revision to SQA-199 "Site Daily Work List" will be issued to put the following changes in place.

a. All work activities in the plant will be scheduled by a central scheduling group. The schedule will be based on plant conditions, work priority and the standard surveillance instruction (SI)/preventive maintenance (PM) schedule.

b. Work coordinator positions have been established to interface between the implementing organizations and the scheduling personnel. Their primary functions will be to ensure schedule commitments are met and to help develop contingency plans when the need arises. The work coordinators have been named and are functioning on an informal basis.

c. Operations unit managers have been established to provide priority and work sequence input for schedule development. They will also play a key role in ensuring the schedule is workable.

d. The plant physical work schedules have been pulled from three different networks and consolidated into one short range network. It will take three to five months to provide for better integration.

e. The short range integrated schedule is now published weekly in a two-week and two-month look ahead; and six times a week in a five day look ahead. Schedule review meetings with all involved parties are held twice weekly.

f. The Daily Work List (DWL) will be produced in a download fashion from the short range integrated schedule.

g. Maintenance activities cannot be loaded on the DWL and released for work until they are planned in detail and loaded into the integrated schedule when system impact is involved.

h. The short range integrated schedule is being resource loaded with the estimates provided by the planning organizations, and the standardized resource requirements for periodic work. This will identify resources shortages so that schedule adjustments can be made.

i. Detailed SI and PM scheduling information is being developed through coordination with the line organizations. This information will be used to develop a standardized annual surveillance schedule. Each SI and PM will be designated as requiring integrated scheduling or not.

j. Currently, Browns Ferry Nuclear Plant (BFNP) is implementing a standards-based estimating system. SQN will evaluate the effectiveness of this system at BFNP. Based on this evaluation, SQN will make a determination to implement the BFNP system or a similar industry estimating system.

4. Work Flow and Control--The Maintenance Management System will be upgraded as follows to improve work request (WR) generation, review, approval, prioritization, release, implementation, post maintenance testing, etc.

   a. Procedure SQM-2, "Maintenance Management System," is being separated into five distinct documents. These documents will address WR initiation and approval, WR planning, WR execution, post maintenance testing and closure, and tracking and maintenance history. Clear lines of responsibility will be defined in each area. This enhancement will result in a less complex WR system. Completion is scheduled for April 29, 1988.

   b. For the long-term, an Automated Maintenance Management System (AMMS) will be implemented to "modernize" the present Maintenance Management structure. Improvements will be realized in WR initiation, input control, planning, line estimations, scheduling, etc. This enhancement will result in a less cumbersome WR system.

5. Performance Measurement

   The Maintenance Superintendent will identify additional performance indicators to be utilized in the evaluation of maintenance performance. These indicators will cover areas such as corrective maintenance, preventive maintenance, and conduct of maintenance. These performance indicators will be identified by April 22, 1988, and a schedule developed for implementation.

CURRENT POLICY

The Site Director and Plant Manager will continue to provide the resources needed to support plant maintenance requirements in a timely fashion while continuing to improve the maintenance program. The separation of Planning and Scheduling functions, establishment of a Systems Engineering Organization, hiring of new managers and implementation of a plant impact evaluation program demonstrate this commitment.

References: SQA-168, System Engineering

SQM-2--"Maintenance Management System," Pages 49 through 50, Section 11.3.1.

SQA-199--"Site Daily Work List," Pages 15, Sections 6.3.1, 6.3.6, 6.3.9, 6.3.10, and 6.3.11.

POST IMPELEMENTATION EVALUATION

In addition to the day to day monitoring of the maintenance managers and other managers, the effectiveness of the above enhancements will be determined by:

1. Monitoring of Average Life (time required to accomplish the performance of a WR package; from loading to field completion) will be performed by the scheduling group. A reduction in the average time required should be observed. The Average Life trending analysis will be performed by the scheduling group and the results submitted to the Maintenance Superintendent for review. The necessary program changes for monitoring will be in place by March 31, 1988.

2. Monitoring of emergent work for signs of a downward trend. This will be an indicator of better planning and scheduling of work activities. The trending analysis will be performed by the scheduling group and the results submitted to the Maintenance Superintendent for review.

3. Monitoring of DWL performance reports for an increase of completed work versus the amount scheduled. This will also indicate fewer delays and conflicts, which is indicative of better coordination, planning, and scheduling. The trending analysis of the DWL performance reports will be performed by the scheduling group and the results submitted to the Maintenance Superintendent for review.

4. An increase in the average number of WRs completed per week should occur. (This data is trended in a weekly status report.)

CONCERN - ORR XI.B

The need for the Operations Control Room Staff to support maintenance activities, by the approval and control of work, is causing excessive distraction to the control room operators. This could cause a plant safety risk if continued during critical operations.

RESPONSE

Sequoyah has taken action to minimize the impact of work control and approval on the control room operators. In the final report of responses which will include long term actions, improved support of maintenance by operations will be addressed.

Corrective action was implemented by revision 10 of AI-30, Nuclear Plant Conduct of Operation, section 14.0 (Control Room Access). To ensure wide-spread knowledge of the changes implemented, the Plant Manager issued the following article (Sequoyah Dispatch) to all employees.

Work Control Counters Will Be Set Up in Control Room

Effective Monday, December 21, 1987 work control counters will be established in the control room for units 1 and 2 in order to assist control room personnel in directing maintenance, modification and testing.

"As we approach plant heatup, the close control of activities affecting plant process equipment becomes even more demanding," said Plant Manager Steve Smith. "We must ensure that we have an efficient and effective method of managing work activities from the control room. Establishing work counters should help accomplish that, as well as minimize the number of plant employees in the control room."

Under this new system, employees who require control room authorization will request support at the unit 1 or 2 counter. Signs will designate the locations of the counters in the control room. Employees will describe the activity and approval required on the work list which is kept at each counter.

"All foremen should make sure that their people requesting work have the required approvals and authorizations," Smith said. "They should also know what page number their item appears on in the Daily Work List."

An assigned work coordinator will keep the appropriate on-shift operator informed of what work is being requested so that efficient handling can be assured with minimal delays.

Once the work control counters are set up, a shift turnover period of 30 minutes will be established to allow control room operators to turn over the shift responsibilities. Phone calls and requests for work authorization should be limited to emergency items only.

Additional steps have been taken to evaluate the potential impact of maintenance and surveillance activities on the plant. Work package and surveillances now require a Plant Operation Impact Evaluation. This evaluation and the associated work package is reviewed by a newly established Work Control Group staffed with Senior Reactor Operators. Its primary function is to review all work packages for completeness, including the Plant Operation Impact Evaluation. This includes identification of prerequisites, plant alarms, system responses, and configuration control issues. This group will also prepare clearances and assure their adequacy, control and coordinate work activities, provide authorization for non-system maintenance, and provide communication to the Shift Supervisor on planned system activities.

A service request program will be developed for processing non-system maintenance activities that do not require Shift Supervisor approval.

CURRENT POLICY

Control Room Access:

In order to prevent adverse conditions that might affect the quality of operation due to excessive numbers of persons or activities within the control room, explicit guidelines for all access to the control room are established in AI-30, Nuclear Plant Conduct of Operations.

Reference: AI-30, Section 14, pages 16-18
Sequoyah Dispatch, December 1987

POST IMPLEMENTATION EVALUATION

Shift Operating Advisors (SOA) have been assigned the responsibility to monitor the effectiveness of the implementation of AI-30 at least through unit 2 startup. The SOA is a highly qualified manager, with an SRO background, who will be making daily reports in accordance with AI-50 to the Plant Manager and Site Quality Manager on operational activities in and out of the control room. These reports, based on the guidance given in AI-30, section 14, will provide the feedback necessary to determine how effective the new policy is in controlling control room traffic.

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CONCERN - ORR XI.C

The existing facilities for storing test meters and equipment in the Instrument Shop is inadequate. It does not assure that test equipment remains in a satisfactory condition to perform properly when required.

RESPONSE

The Measuring and Test Equipment (M&TE) program is being revised. The new program will incorporate the following changes:

1. New storage area including the proper shelving and lockers will be provided for all M&TE used at Sequoyah Nuclear Plant by June 1, 1988.

2. All M&TE will be brought under one control system at one single point by June 1, 1988. Instruction AI-31 Control of Measuring and Test Equipment will be revised and approved by April 1, 1988 with an implementing period from April 1, 1988, until July 1, 1988.

3. The new AI-31 revision will specify when feasible verification of Test Equipment prior to and after use. The new storage area will have a test bench to facilitate this testing.

4. The new storage area will address the wire mold receptacle problem and ensure proper arrangement of power cords to reduce the risk to M&TE. Wire molds if used will be arranged to allow efficient use of available shelf space. Estimated completion for this activity is June 1, 1988.

CURRENT POLICY

The M&TE issue clerk and users of the M&TE are expected to know the importance of handling M&TE.

Adequate storage area shall be provided to allow all M&TE a proper location until issue. A specific location shall also be provided for out-of-calibration, damaged, or other devices needing special care or attention.

Reference: Administrative Instruction (AI-31), Revision 8, page 16, Sections 17 and 19.
Nuclear Quality Assurance Manual (NQAM), Part III, Section 3.1, Control of Measuring and Test Equipment.

POST IMPLEMENTATION EVALUATION

Verification of the effectiveness of this corrective action will be accomplished by the departmental M&TE Supervisor.

M&TE Out-of-Tolerance Reports will be monitored by the M&TE Supervisor or his designee to observe the new system for expected reduction of out-of-tolerance conditions and to determine the time required to complete out-of-tolerance investigations.

The new storage area and the proposed changes will all be in place and operational on or about June 1, 1988.

Management Action Tracking System (MATS) #10620 has been assigned to review the M&TE program for proper implementation. This will be assigned to the Maintenance Superintendent.

CONCERN - ORR XII

The practices employed for system alignments did not provide full assurance that valve and electrical lineups are correct.

RESPONSE

The problems encountered in the initial valve lineup for mode 4 resulted in procedure OSLA-58 being cancelled. A new procedure, AI-58, was developed to redefine and improve the plant configuration control for system alignment.

This new procedure has been implemented and the system alignment for mode 4 completed. The results from the new procedure have been audited by Quality Assurance and inspected by the Nuclear Regulatory Commission and found to be satisfactory.

CURRENT POLICY

SQN policy is to maintain configurational control of systems needed for startup and operation of the plant. These systems are listed on Appendix A and D of Administrative Instruction (AI) 58 and one or the other of these Appendixes of listed systems will be maintained at all times.

Reference: AI-58, Revision 1

POST IMPLEMENTATION EVALUATION

Audits and inspections by Operations Group Management, Division of Nuclear Quality Assurance and the Nuclear Regulatory Commission of the system alignment process are complete and the results satisfactory. This program is satisfactorily implemented for initial valve lineup and adequate procedures are in place to support configuration changes and subsequent valve lineups.

CONCERN - ORR XIV.A

Evidence exists that responsibility and accountability for plant systems is lacking.

RESPONSE

This concern is directed at the lack of accountability in maintaining equipment material condition and resolving problems requiring temporary alterations to be installed for excessive periods of time.

The System Engineer concept is being improved to ensure that a specific individual has the responsibility to monitor the operating performance and maintenance history of the equipment in assigned systems and to maintain an awareness of the material condition of the equipment.

Actions include the following:

1. SQA-168, Revision 0, will be revised to reflect the current philosophy and direction on the use of system engineers by March 22, 1988.

2. Systems engineering staffing is being increased through support from the Division of Nuclear Engineering, the Restart Test Group, filling open vacancies and merging appropriate Maintenance Engineers into this section. The current goal is to have a staff of fifty (50) systems engineers as well as an appropriate special projects staff to properly support them. Twenty-six (26) systems engineers currently exist. Total section staffing is currently being evaluated.

3. System engineers have been assigned to all plant systems. Reassignments will occur as staffing progresses. Systems engineers are assuming the responsibility and accountability for the performance of their systems as they are assigned or as they reach the necessary level of expertise on their systems.

4. Systems engineering instructions are being finalized to cover such items as system information/history files, system walkdown guidelines, trending guidelines, investigation/testing guidelines, shift coverage guidelines, etc. These instructions are scheduled to be in place by March 28, 1988.

5. A training plan is being finalized to provide a documented program in the areas of plant administrative instructions, systems training, on-the-job training, testing methodology, and engineering technical training. This plan will be in place by March 19, 1988.

The ORR Team made reference to a number of significant deficiencies.

These were identified by the Systems Engineering Section and a walkdown completed. No items were determined to be required for restart but corrective action was completed or initiated for each item.

CURRENT POLICY

The current policy for systems responsibility and accountability is as follows:

1. All systems within the Sequoyah Nuclear Station shall be assigned to a qualified individual within the Plant Manager's Systems Engineering Section. This will eliminate the past confusion over who has responsibility for systems problems.

2. Each Systems Engineer shall be responsible for:

   a. Providing the day-to-day engineering support and evaluation of system performance and operation including trending of associated issues (e.g., performance).

   b. Providing timely corrective actions and investigations of equipment problems, both systems and component level, as identified to Systems Engineering.

   c. Evaluating trends of equipment/systems performance, equipment failures, etc., to ensure optimum performance and reliability.

   d. Performing root cause analyses to applicable problems as they arise.

   e. Proposing modifications to plant equipment and systems as required.

   f. Providing technical reviews of the adequacy of test results as required.

   g. Providing on-shift coverage, when assigned, to support plant operation and outages.

   h. Following through on identified problems to ensure timely corrective measures, which include coordinating the issuance of the appropriate design changes, implementation of the required change, revision to appropriate plant procedures, etc.

   i. Evaluating the adequacy of the existing preventive maintenance program for assigned equipment/systems.

   j. Performing tests on equipment and systems as required in order to ensure optimum performance.

Reference: SQA-168, System Engineering

POST IMPLEMENTATION EVALUATION

1. The Supervisor, Systems Engineering Section, will review the planned approach to be taken on each safety system and the condensate feedwater, and main steam systems to ensure that priorities are correct. The criteria for acceptance must include plans to address known deficiencies, system performance, during tests on normal operation and system inspections to determine material condition problems.

2. The Technical Support Superintendent and the Supervisor will evaluate material condition by in plant observations and discussions with operators and chemistry personnel.

   They will also routinely monitor the status of problems, potential problems and improvements on the systems to ensure the system engineers maintain an accurate status and are making improvements in a timely manner.

CONCERN - ORR XIV.B

Actions taken to implement the concept of plant "ownership" by operations could lead to confusion as to the responsibilities of various support organizations.

RESPONSE

AI-30, section 5.0 will be revised to read as follows:

Plant ownership is intended to indicate control and a directing or restraining influence on all activities occurring in or affecting the plant. Accordingly, the operators (all classifications) are the owners of the plant. Each individual operator is the owner of the equipment in his/her assigned area. This ownership means that operators have to be concerned with anyone doing anything to their equipment. For example, if someone doesn't have a procedure, they do not work on your equipment because, there is a high probability they will cause a malfunction of your equipment.

All other groups are support groups for the operation of the plant, each having responsibilities for specific duties. For example, engineering is responsible for the technical aspects of the equipment. That is, they issue drawings and specifications that operators must operate within. If these specifications cannot be operated within, engineering has to fix the problem. Also, if equipment must be operated outside its specifications, operations must have engineering approval. Usually, this is accomplished by a USQD generated by a DCR, DCN, or TACF. Modifications has the responsibility to install new equipment and to ensure it functions as designed. Maintenance is responsible for maintaining plant equipment as designed in their preventive and corrective maintenance programs, and so on with each organization. Each contributes to the safe and successful operation of the plant. (Basically, there is only one team at SQN: The one that operates it and supports its operation.)

A revision to AI-30 was initiated on January 25, 1988. Upon approval and issue of this revision, a handout and short presentation of this change will be given to the operators at shift turnover for all six groups by March 17, 1988.

CURRENT POLICY

Current policy is reflected in the change to AI-30 discussed above. It is necessary that operators understand the ownership role of others. For example, engineering is responsible for the technical aspects of the equipment. They issue drawings and specifications that operators must operate within. If these specifications cannot be met, engineering has to fix the problem. Also, if equipment must be operated outside its specifications, operations must have engineering approval. Usually, this is done

following an Unreviewed Safety Question Determination (USQD) generated by a DCR, DCN, or TACF. Modifications is responsible for installing new equipment in accordance with design. Maintenance is responsible for maintaining plant equipment as designed in their preventative and corrective maintenance programs, and so on with each organization. Each contributes to the safe and successful operation of the plant.

Reference: AI-30, section 5.0.

POST IMPLEMENTATION EVALUATION

The SOA's will monitor the effectiveness of the implementation of AI-30 through unit 2 startup. The SOA makes daily reports to the plant manager and site quality manager. These AI-50 reports along with guidance given in the body of the instruction cover the major areas of AI-30, Conduct of Operations.

RECOMMENDATION - INPO IV.A.1 (APPENDIX B)

Prior to unit 2 startup, plant procedures for reactor startup should be revised to provide guidance on the utilization of source range counts and rod height data as a tool for predicting criticality. Additionally, training should be provided for each licensed operator, senior operator and shift technical advisor to ensure correct utilization and understanding of the doubling method for reactor startup.

RESPONSE

Applicable plant procedures have been revised to incorporate the INPO recommendation.

The operating crews used the revised procedures during the special startup training which was completed in February.

In addition to the changes already made, the procedures will be further changed to make more frequent pauses during the approach to critical to monitor source range counts and rod height data. Specifically, count rate data will be obtained every 50 steps of control bank rod withdrawal during the approach to critical. This data will be used to plot Inverse Count Rate Ratios which will be used to predict criticality. Applicable procedures will be revised and operating crews trained prior to unit 2 startup.

CURRENT POLICY

The following is an excerpt from the General Operating Instructions (GOI).

Control Bank Withdrawal

1. _____ Verify _ 1/2 cps on the highest reading SR instrument.

2. _____ Record SR count rates:

N31 _____ cps N32 _____ cps

NOTE: These count rates are to be used as a reference during the approach to critical. Criticality can be expected to occur when those count rates have doubled approximately five to seven times.

CAUTION: Criticality should be anticipated anytime positive reactivity is being inserted.

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3. _____ Withdraw the control banks in manual in accordance with SOI-85.1, verifying rod position indicators are within ± 12 steps of the group demand counters. The unit enters mode 2 administratively when the control banks are first withdrawn (log in journal).

4. _____ Each time the SR count rate doubles, briefly stop control bank withdrawal and allow the count rate to stabilize. If the count rate indicates that criticality will be achieved outside the limits specified in step P, comply with the actions of step P.1.

5. _____ Rod height at criticality must be within minimum and maximum limits. The limits are as follows:

   (a) Above the zero power rod insertion limits. (SI-38, Data Sheet 2, or TI-28, Figure A.6.)

   (b) The critical rod position must not deviate from the estimated critical rod position by more than a number of rod steps corresponding to ±1000 pcm. Minimum and maximum rod position error band is given in SI-38, Data Sheet 2.

   (c) Below the withdrawal limit to ensure a negative moderator temperature coefficient (SI-38, Data Sheet 2).

Reference: GOI-2, Revision 45, section V, page 11

POST IMPLEMENTATION EVALUATION

Verification of the effectiveness of these corrective actions will be accomplished by demonstration of satisfactory performance during the simulator sessions of the special startup training.

This verification will be complete prior to unit 2 restart.

RECOMMENDATION - INPO IV.A.2 (APPENDIX B)

Prior to unit 2 startup, provide clear direction in applicable procedures that define when it is appropriate to calculate or verify SDM. Procedures should direct the operator to calculate or verify SDM whenever required by technical specifications or when the SDM is in doubt due to abnormal indications or count rate.

RESPONSE

GOI-2 has been revised to require verification of SDM anytime criticality does not occur within the minimum or maximum permissible limits.

The operating crews will use the revised GOI-2 during the special startup training to be conducted prior to unit 2 restart.

CURRENT POLICY

The following is an excerpt from GOI-2:

If criticality cannot be achieved within these limits, do not continue rod withdrawal.

(a) _____ Insert all control bank rods to the bottom of the core.

(b) _____ Recalculate the ECC and shutdown margin in accordance with SI-38. Determine and correct the discrepancy and establish a boron concentration required to achieve criticality within the limits above.

(c) _____ If critical rod height was low, then borate to the new estimated critical boron concentration per SOI-62.2 and equalize boron concentration between the reactor coolant loops and the pressurizer by opening spray valve(s).

(d) _____ If critical rod height was high, then dilute to the new estimated critical boron concentration per SOI-62.2 and equalize boron concentration between the reactor coolant loops and the pressurizer by opening spray valve(s).

NOTE: Nuclear instrumentation shall be monitored very closely in anticipation of unplanned reactivity rate of change.

(e) _____ Recalculate the critical rod position using the new boron concentration and ensure the rod position is within the limits stated in "P" above.

CAUTION: When the reactor is critical and Tavg 551°F and Tavg-Tref deviation alarm not reset, perform SI-127 every 30 minutes (SR 4.1.1.4.b)

(f) _____ Withdraw the control banks in manual and take the reactor critical. Ensure critical rod height is within the limits.

Reference: GOI-2, Revision 46, section V, page 12

POST IMPLEMENTATION EVALUATION

Verification of the effectiveness of these corrective actions will be accomplished by demonstration of satisfactory performance during the simulator sessions of the special startup training.

This verification will be complete prior to unit 2 restart.

RECOMMENDATION - INPO IV.A.3 (APPENDIX B)

Redefine the administrative definition for entering mode 2 as being when the control banks are first withdrawn. This method is utilized by many other plants to eliminate interpreting when entrance into mode 2 occurs, and provides conservative shutdown margin determinations. In addition, clear guidance should be provided in the applicable plant procedures on the required actions to ensure safe reactivity control and adequate shutdown margin, if the reactor does go critical below the rod insertion limits.

RESPONSE

GOI-2 has been revised to include a step prior to control bank withdrawal that will administratively place the reactor in mode 2 when the control banks are first withdrawn.

The operating crews will use the revised GOI-2 during the special startup training to be conducted starting February 1, 1988 and completed prior to unit 2 restart.

CURRENT POLICY

The following is an excerpt from GOI-2:

Withdraw the control banks in manual in accordance with SOI-85.1, verifying rod position indicators are within ± 12 steps of the group demand counters. The unit enters mode 2 administratively when the control banks are first withdrawn (log in journal).

Rod height at criticality must be within minimum and maximum limits. The limits are as follows:

(a) Above the zero power rod insertion limits. (SI-38, Data Sheet 2, or TI-28, Figure A.6).

(b) The critical rod position must not deviate from the estimated critical rod position by more than a number of rod steps corresponding to ±1000 pcm. Minimum and maximum rod position error bank is given in SI-38, Data Sheet 2.

(c) Below the withdrawal limit to ensure a negative moderator temperature coefficient (SI-38, Data Sheet 2).

If criticality cannot be achieved within these limits, do not continue rod withdrawal.

(a) _____ Insert all control bank rods to the bottom of the core.

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(b) _____ Recalculate the ECC end shutdown margin in accordance with SI-38. Determine and correct the discrepancy and establish a boron concentration required to achieve criticality within the limits above.

(c) _____ If critical rod height was low, then borate to the new estimated critical boron concentration per SOI-62.2 and equalize boron concentration between the reactor coolant loops and the pressurizer by opening spray valve(s).

(d) _____ If critical rod height was high, then dilute to the new estimated critical boron concentration per SOI-62.2 and equalize boron concentration between the reactor coolant loops and the pressurizer by opening spray valve(s).

NOTE: Nuclear instrumentation shall be monitored very closely in anticipation of unplanned reactivity rate of change.

(e) _____ Recalculate the critical rod position using the new boron concentration and ensure the rod position is within the limits stated in "P" above.

CAUTION: When the reactor is critical and Tavg 551°F and Tavg-Tref deviation alarm not reset, perform SI-127 every 30 minutes. (SR 4.1.1.4.b)

(f) _____ Withdraw the control banks in manual and take the reactor critical. Ensure critical rod height is within the limits.

POST IMPLEMENTATION EVALUATION

Verification of the effectiveness of these corrective actions will be accomplished by demonstration of satisfactory performance during the simulator sessions of the special startup training.

This verification will be complete prior to unit 2 restart.

RECOMMENDATION - INPO IV.A.4 (APPENDIX B)

Prior to unit 2 startup, all WOG ERGs that are not included in the station emergency operating procedure (EOP) base should be carefully reviewed for implementation, unless a sound technical basis exists for exclusion. Verification, validation, and training needs to be conducted on any new EOPs resulting from this review.

RESPONSE

Sequoyah has now adopted 40 of the 43 Westinghouse Owner's Group (WOG), Emergency Response Guidelines (ERG). Sequoyah does not plan to adopt the remaining three, and justification has been provided to the NRC. Approval by the NRC for these three exceptions has not been received but is expected.

Five of the guidelines have recently been added to the emergency operating procedure base, and training on the new procedures is in progress. All of the operating crews assigned to unit 2 restart will complete this training prior to restart.

CURRENT POLICY

NA

POST IMPLEMENTATION EVALUATION

Verification of the effectiveness of these corrective actions will be accomplished by demonstration of satisfactory performance during the simulator sessions of week 1 requalification.

RECOMMENDATION - INPO IV. A.5 (APPENDIX B)

The configuration status control program is unnecessarily complicated. This results in performance errors in maintenance of status records. Simplify the status control program to reduce the probability of errors in status records.

RESPONSE

The old procedure, OSLA-58 has been cancelled and a new procedure, AI-58 written to redefine and improve configuration control. AI-58 provides the operator the flexibility to control system alignment during outage or operation for situations where alignment may depend upon certain variable parameters.

CURRENT POLICY

SQN policy is to maintain configurational control of systems needed for startup and operation of the plant. These systems are listed on Appendix A and D of AI-58 and one or the other of these Appendixes of listed systems will be maintained at all times.

References: AI-58

POST IMPLEMENTATION EVALUATION

The new AI-58 has been implemented and the plant has been configured for mode 4. Reviews by Operations Management, audits by QA and inspections by NRC have determined that configuration control is now satisfactory.

RECOMMENDATION - INPO IV.A.6 (APPENDIX B)

Expedite the implementation of the writers guide and initiate a program for upgrading the plant operating procedures. In addition, biennial review of procedures prior to the implementation of the writers guide should include correction of the most significant human factor deficiencies.

RESPONSE

The Corporate Writer's Guide for normal operating instructions will be issued by June 1988.

Emergency operating instructions have been revised to improve human factor considerations, improve technical and administrative accuracy, and improve consistency between procedures. Operations Section Instruction Letter (OSLA) 104, "Writer's Guide for Operations Instruction" and OSLA 107, "System Operating Instruction Review and Verification Checklist" were the guidance documents for this effort.

A special staff organization has been established and is currently managing the enhancement effort for maintenance and surveillance instructions. This organization will manage the normal operating instruction enhancement program after issuance of the related corporate writers' guide. The operations procedure enhancement effort will follow the maintenance and surveillance instruction enhancement program.

A program will be implemented to revise procedures during biennial reviews to remove action steps from notes and cautions, to ensure that notes and cautions proceed applicable action steps, and to separate multiple action steps in accordance with applicable human factor considerations.

CURRENT POLICY

Operations procedures are currently revised using Operations Section Instruction Letters (OSLA).

Reference: OSLA 104, Writer's Guide for Operations Instruction
OSLA 107, System Operating Instruction Review and Verification Checklist

POST IMPLEMENTATION EVALUATION

The procedures staff, reporting to the Plant Manager, will track the status of maintenance and surveillance instruction enhancement and will advise the Plant Manager when a similar operations procedure enhancement effort should begin.

The Project Manager, Instruction Review, manages the overall procedure enhancement effort for the Plant Manager and will ensure that biennial reviews are correcting human factor problems with caution statements and action statements.

RECOMMENDATION - INPO IV. A.7 (APPENDIX B)

Whenever practical require second person verification to be performed by a person not accompanying the person performing the manipulation. In addition, require a check of clearance boundaries for adequacy by a qualified person.

RESPONSE

Complete separation of independent verifiers for valve and electrical alignments will be implemented by June 1, 1988.

For safety clearances, Sequoyah will implement a system for developing tagouts such that the boundaries are defined, prints marked up and tags prepared by someone other than the Assistant Shift Engineers. The clearance, with marked up prints, will be submitted to the appropriate Assistant Shift Supervisor for final check and approval. This method of establishing clearances is being developed and will be implemented by June 1988.

The current procedure will remain in effect until June; however, the CURRENT POLICY section below shows that there is a great deal of emphasis on the clearance holders and workers verifying they are working under adequate clearances.

Workers are instructed to approach all work as if the system is pressurized (mechanical) or energized (electrical) and to loosen flanges very slowly or take electrical measurements as appropriate at the commencement of work.

CURRENT POLICY

Excerpts from plant procedures:

The person holding the clearance shall be assured the equipment is properly cleared and tagged through discussion with the SS or designated Ast. SS, by physical verification of tag location and correct component alignment, or verification of zero voltage or pressure, as applicable.

Reference: AI-3, section 4.0, page 16, 4.3.4

It shall also be the responsibility of the craft representative performing work on any piece of equipment to assure himself that the equipment is properly cleared and tagged before any work is started.

Reference: AI-3, section 4.0, page 17, 4.4.2

NOTE: After the clearance has been issued and before work is permitted to proceed, the person receiving the clearance must assure himself

that the equipment is properly isolated and that protective tags are correctly placed. If safety grounds are required, Section 9 shall be used for instruction.

Reference: AI-3, section 5.0, page 25, 5.3.3

POST IMPLEMENTATION EVALUATION

Shift Operations Advisors and Operations Group Managers will monitor and evaluate independent verification of system alignments including safety clearances.

RECOMMENDATION - INPO IV. B.1 (APPENDIX B)

Prior to the startup of unit 2, establish administrative controls over alignment data that will ensure the data used is the most current.

Note: The ORR Team had the following concern relative to this recommendation - See ORR section XV paragraph G.

"INPO personnel listed a specific finding regarding the implementation of administrative controls for nuclear instrumentation alignment data prior to restart. This has generic implications regarding other safety and critical system data availability and quality."

RESPONSE

The instrument maintenance section has evaluated the control of data used in the calibration and functional test procedures for the neutron monitoring system and changed the procedures to ensure that the data used is the correct data. For the short term, Instrument Maintenance personnel will obtain a copy of the necessary data from the Reactor Engineering Section and attach this data to the instrument procedure being performed. Before entering Mode 2, the Instrument Maintenance section will develop and implement a program to control all data that must be retrieved for use in the conduct of a calibration or test.

Control and disposition of all data is being reviewed as operations, maintenance and surveillance instructions are revised under the long term procedure enhancement program.

CURRENT POLICY

Instrument Maintenance Procedure IMI-92-PRM-CAL, IMI-92-PRM-FT, IMI-92-IRM-CAL, and IMI-92-IRM-FT now require that alignment data from previous procedures be obtained via the Reactor Engineer from an official procedure.

POST IMPLEMENTATION EVALUATION

The Maintenance Superintendent and the Instrument Maintenance Group Supervisor will review the implementation of the program to control data to ensure that the controls are adequate and that all applicable procedures are addressed in the program.

RECOMMENDATION - INPO IV.B.2 (APPENDIX B)

Review the maintenance department procedures for human factors problems such as those noted above. Place additional emphasis on those procedures that require the use of previous alignment data in calculations or have the possibility of causing inadvertent plant system actuation. Record all needed data, such as previous alignment data, in the procedure and require critical calculations be second-checked by another qualified technician. Place notes prior to the step in which they apply; remove action statements from notes and place them in the body of the procedure.

RESPONSE

All Maintenance instructions are being revised to satisfy the Corporate Writers Guide requirements. The Corporate Writers Guide incorporates human factors such as using consistent, clear, format, removing action steps from notes and cautions, bolding actions verbs utilizing italics to emphasize notes, providing clear acceptance criteria with the action step, providing adequate worksheets, and obtaining input from users. The writers guide does specify that calculations which affect safety related systems or equipment be checked by a second person. This upgrade is a long-term project and is currently scheduled as a three-year program..

The four Instrument Maintenance Instructions (IMIs) (IMI-92-PRM-FT, IMI-92-PRM-CAL, IMI-92-IRM-FT, IMI-92-IRM-CAL) will be revised to Require Instrument Maintenance to obtain the necessary data from the Reactor Engineering Section by adding a copy of the applicable data to the IMIs and providing a signature block for Reactor Engineering to certify that the data is current. (Note: A temporary change has already been made to require this action pending more thorough revision of the procedure.)

CURRENT POLICY

The maintenance instruction Writers Guide addresses the following:

1. That notes should not tell the performer what to do or what not to do.

2. Forms or data pages for performing and plotting repeated calculations.

3. A format that mandates the required method of calculation.

Reference: Writers Guide for Maintenance Instructions ONP-STD-4.4.7, Attachment 2, Revision 0-C, Page 24, Section 3.7. Also, Page 35, Part 4.1 related to calculations.

POST IMPLEMENTATION EVALUATION

1. Temporary changes for the four affected IMI revisions have been completed.

2. The effectiveness of maintenance instructions revisions will be evaluated using feedback from the verification/validation process. In addition, the Procedure Revision Project "Enhancement Review Group" will be directly involved in the validation process and will provide management feedback related to procedure effectiveness. This will be evaluated by the Manager of the Procedure Review Group.

3. The Maintenance Superintendent will evaluate the effectiveness of the maintenance instruction revisions through feedback from craft.

RECOMMENDATION - INPO IV.B.3 (APPENDIX B)

Ensure all maintenance craftsman and supervision understand plant requirements regarding procedure compliance and operator authorization prior to starting work on equipment.

RESPONSE

There has been a significant effort to inform all craftsmen and supervisors of the requirement for procedure compliance and to ensure they are aware of the need for operator authorization prior to starting work on equipment.

The Plant Manager has held meetings with the entire plant staff and informed them of the requirement to follow procedures. The Deputy Site Director has sent a memorandum to every site employee informing them of the requirement to follow procedures.

The requirement to follow procedures and to keep operators informed of work affecting plant equipment is clearly and widely established in plant procedures. This is evident in the references under CURRENT POLICY.

Prior to unit 2 restart, the maintenance craft personnel who will be supporting restart and who frequently interact with Operations, will receive training on communications and professionalism in dealing with operations. This training will be completed by March 3, 1988.

CURRENT POLICY

Excerpts from plant procedures on procedure compliance

"As an employee of a nuclear plant, you are required by law to use and to follow approved written instructions/procedures while performing activities affecting critical structures, systems and components.

Reference: SQM1 Revision 14, Appendix E.

"The craftsman shall perform the work according to the instructions of the WR/MR. Deviation from work instructions is not permitted. If work cannot continue due to insufficient or incorrect work instructions, work shall not continue and the WR package shall be replanned."

Reference: SQM2 Revision 27, page 50.

"Maintenance, which can affect the performance of critical structures, systems, or components (CSSC) equipment, shall be properly preplanned and performed in accordance with written procedures or documented

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instructions appropriate to the circumstances and which conform to applicable codes, standards, specifications, and criteria."

Reference: SQM57 Revision 9, page 1.

"Each employee shall be responsible for conformance with the requirements of site instructions. Employees guilty of willful or repeated violations may be disciplined in accordance with site administrative procedures.

Reference: AI-4 Revision 66, page 33.

"If work to be done is on installed CSSC plant equipment, the appropriate Operations Section representative's signature shall be placed on the maintenance request (MR) form. The Operations Section signature signifies that work instructions do not violate technical specification."

Reference: SQM2 Revision 27, page 49.

"If the PM work affects operability of installed CSSC plant equipment, the SE or SRO of the affected unit(s) (both unit 1 and 2 SRO for common equipment) shall sign or initial the operations notification authorizing the start of work. The same applies for notification of work completion. If the PM work affects operability of non-CSSC plant equipment, the authorization to start work shall be obtained from the SE or SRO and RO of the affected unit(s) (both unit 1 and 2 SRO and RO for common equipment). This authorization shall be documented by placing the names of the operations representatives and signature of the person obtaining the authorization in the appropriate space. The same applies for notification of work completion."

Reference: SQM57 Revision 9, page 8.

POST IMPLEMENTATION EVALUATION

The Maintenance Superintendent and the Craft Group Supervisors will observe at least one procedure a week being performed by the craftsmen. This will continue until overall performance is satisfactory. They will ensure that the latest procedure is in use, that any data obtained for the procedure is correct, that the procedure steps are followed, the required data obtained during the test is logged properly, and that job planning has been adequate.

RECOMMENDATION - INPO IV.B.4 (APPENDIX B)

Provide training to the plant electrical maintenance personnel on annunciator circuits and related drawings.

RESPONSE

The Sequoyah Nuclear Plant (SQN) Electrical Group Supervisor has initiated the following actions:

1. On January 27, 1988, four (4) electricians completed all formal classroom training listed as prerequisites in EMSL-A67 for performance evaluation in On-the-Job-Training (OJT) Tasks ELS116, Test Annunciator System and ELS117, Repair Annunciator System.

2. Electricians who have completed OJT prerequisites for annunciator maintenance work will be given OJT work assignments and signed off on annunciator tasks when proficient in all Job Performance Measures listed in EMSL-A67, Attachment 4.07.2 and 4.07.3.

3. Job Performance Measures in the OJT evaluation will require the electrician to demonstrate ability to test annunciator system cards, determine location of problem (field or local panel), and locate faulty cards. Electricians who complete the annunciator maintenance prerequisite classroom training and the inplant OJT process will be properly qualified in annunciator maintenance tasks including knowledge of annunciator circuits and related drawings.

CURRENT POLICY

The DNT Technical and Craft Training Section Supervisor shall ensure a training program is implemented at SQN as required by PMP 0202.08. The Technical and Craft Training Section Supervisor is responsible for training requests from the SQN Maintenance Superintendent and shall provide formal classroom training to support electrical and mechanical maintenance craftsmen training at SQN.

Reference: SQN AI-14, Appendix I, Page 2

The SQN Maintenance Superintendent shall identify to the DNT any need to revise existing training or to develop new training to meet plant identified training needs. He shall ensure that training is scheduled and conducted at SQN to meet the requirements of PMP 0202.08.

Reference: SQN AI-14, Appendix I, Page 2

Each Maintenance Group Supervisor shall be responsible for the overall training program for his group. He shall publish a detailed section instruction letter to define the training program for that group. He shall determine the number of individuals to be trained and qualified in each duty area.

Reference: SQN AI-14, Appendix I, Page 2

A continuing training program has been established for all annual craft personnel. This program is designed to maintain and improve the skills and knowledge of the participants. Continuing training consists of systems retraining, selected courses from the Electrical Update and Mechanical Update Training Curriculum, and training based on significant industry and operating experience.

Reference: SQN AI-14, Appendix I, Page 3

POST IMPLEMENTATION EVALUATION

The SQN Electrical Maintenance Group Supervisor will monitor the OJT annunciator maintenance task assignments to ensure sufficient numbers of electricians are in the OJT qualification process and adequate progress is being made in developing proficiency in annunciator maintenance.

RECOMMENDATION - INPO IV.B.5 (APPENDIX B)

Upgrade the station planning and scheduling effort as follows:

a. Require each TVA organization involved in restart to identify all remaining work. Require these organizations to provide a realistic schedule for the completion of the work including assumptions used for determining the timing of needed support such as technical resolution and off-site concurrences.

b. Develop a comprehensive, credible startup schedule that includes all required work and takes into consideration manpower, parts, and other needed support.

c. Clearly define in writing, the duties, responsibilities, and authority of all individuals and organizations involved in scheduling activities.

d. Provide senior management support and oversight in the development of the schedule to ensure all organizations efforts are directed toward a common goal.

RESPONSE

a. Each TVA organization involved in restart has identified all remaining work. This work is being reconciled and completed in accordance with mode changes during the heatup process.

b. There is a clearly defined startup schedule. All required work is in the startup schedule and the major impacts are from emergent work.

c. The site Planning and Scheduling Group has been reorganized into separate groups; one for planning and one for scheduling. This will allow a planner to concentrate only on planning and a scheduler on scheduling and will improve efficiency in both areas. Revision 2 of SQA-199 will define these changes and responsibilities. (This revision will be completed by March 18, 1988.) Corporate and Site personnel are presently developing position descriptions and responsibilities for the new organization.

d. The Plant Manager has become actively involved in providing guidance in developing a scheduling program/organization that ensures a common goal schedule. He has provided a great deal of guidance to the planning and scheduling organizations in development of the program.

CURRENT POLICY

The current revision (R1) of SQA-199 defines the requirements and responsibilities of the Planning and Scheduling Group. However, by Plant Manager directive, the new organization (separate planning and scheduling groups) is now being put into effect to provide immediate improvements in planning and scheduling efficiency.

REFERENCE: SQA-199

POST IMPLEMENTATION EVALUATION

The effectiveness of the scheduling and planning groups will be monitored by the Plant Manager and Maintenance Superintendont to determine if planning and scheduling are adequate to ensure that all work is completed in a timely manner.

RECOMMENDATION - INPO IV.B.6 (APPENDIX B)

Upgrade the coordination of work activities as follows:

a. Provide for the next day's documents to Operations a minimum of 24 hours in advance. Establish a method that allows Operations authorization prior to the scheduled performance and permits prompt initiation on the shift the work is to be performed.

b. Assign each task to an individual shop (and foreman if possible). Have that shop maintain responsibility for the task from beginning to end and discontinue the practice of writing multiple work requests for the same tasks. If support work is required, write the necessary steps into a single document, with the "owning" shop maintaining coordinating responsibilities.

c. Schedule several days in advance and provide this information to the first-line supervisors. The scheduling should be performed by a group with knowledge of overall plant direction.

RESPONSE

The following are corrective actions that have been taken to improve the coordination between Maintenance and Operations in scheduling and authorizing maintenance work activities.

a. The schedule for physical work Daily Work List (DWL) is now "frozen" two days prior to implementation date. Additions are only allowed for emergency and emergent work. This allows more time for advance preparation and review. This corrective action is presently being implemented administratively as a result of a Plant Manager verbal directive.

   A Work Control Group has been established to function as an interface between Operations and other supporting organizations in the evaluation and authorization of work activities. This will reduce conflicts where there are interactions between work activities, better define work activities, and reduce the possibility of inadverent plant transients.

b. Currently, each work package is assigned to a responsible foreman. If support work is required from another craft discipline, that portion of the work activity is planned by the appropriate discipline and included in the one package. However, the assigned shop will maintain responsibility of the work package.

c. The process for prescheduling work activities on the preliminary DWL is an ongoing process with a loading deadline of two days prior to publication. Additions after that require the preparation and approval of an emergent work sheet except for minor impact additions to existing system outages, high piority operations needs and support work

added by a section for its own work. These may be added the day before the scheduled publication without completing an emergent worksheet. The following are additional enhancements to the program:

d. System outage scheduling is being provided for for SIs, PMs, and CMs.

e. Section Work Coordinators are being established to improve interface/coordination between the Maintenance Scheduling Section, Operations, and other support groups.

f. The P2 schedule is now being published on a daily basis. This will ensure better agreement between the DWL and P2 and result in less confusion concerning schedules. The 5-day look-ahead schedule is now being published. P2 and the DWL drive the 5-day look-ahead schedule. After implementing the system outage scheduling for SIs, PMs, and CMs, the 5-day look-ahead schedule will be frozen. These actions are being implemented administratively (except for 5-day look-ahead, which is addressed in SQA-199).

g. Upon the identification of all activities on the preliminary DWL at 11:00 a.m. each day (PM, SI, WR, WP, etc.), the appropriate plant designated support individual (scheduler) will coordinate the activities required to ensure each scheduled job can be performed the next day.

h. The Operations DWL Coordinator submits the final coordinated preliminary DWL, from all plant groups, to the Maintenance and Surveillance Scheduling Section for approval and distribution of the DWL (targeted for 12:00). A prudent amount of contingency work can be scheduled to ensure full personnel utilization. This contingency work must be flagged with a "c" under the priority section. All contingency work items on the DWL must be coordinated in advance with all conflicts resolved and support agreed upon.

CURRENT POLICY

References: 1. SQM-2, Section 11.3.1
2. SQA-199, Sections 6.3.1, 6.3.6, 6.3.9, 6.3.10, and 6.3.11

POST IMPLEMENTATION EVALUATION

Maintenance Management will monitor emergent work for signs of a downward trend. This will be an indicator of better planning of work activities. In addition, DWL performance will be monitored for an increase in completed work versus amount scheduled. This indicates fewer delays and conflicts, which is indicative of better coordination, planning, and scheduling. The trending analysis of the DWL performance report will be performed by Scheduling and submitted to the Maintenance Superintendent for review.

RECOMMENDATION - INPO IV.B.7 (APPENDIX B)

Place additional emphasis on the replacement of overhead lighting in critical areas to ensure that adequate lighting is maintained. Review the need for maintaining the higher than normal voltage on station electrical buses.

RESPONSE

The areas specifically listed have been added to the Electrical Maintenance lamping log and these areas have been relamped.

The preventive maintenance (PM) for auxiliary building lighting will be revised to list specific areas on each elevation of the Auxiliary Building to ensure that these areas receive additional attention. As currently written, the PM has only one signoff for each elevation and the additional signoffs for specific rooms will provide this needed enhancement. The revision will also provide for an indication as to whether or not relamping was required and will include a measurement of voltage on the lighting board. Based on this information the cognizant engineer can evaluate the need to lower voltages or change the frequency of the PM. The PM will be changed by March 15, 1988.

It has been determined that the tap settings for the Auxiliary Building lighting transformers on elevation 669 were set on the second to the lowest setting. For extended outages, common board voltages are typically high. For these outages, Electrical Maintenance will evaluate voltage levels and advise the Operations Section accordingly. The Operations Section will adjust the tap settings as required.

CURRENT POLICY

PM of the Auxiliary Building lighting is accomplished by performance of a PM package that has a signoff for each elevation, indicating that lighting on that elevation is operable. This PM authorizes replacement of burned out bulbs and requires that a work request be written to replace or repair damaged fixtures.

The policy for corrective maintenance is outlined in an Electrical Maintenance section letter. This letter describes the use of the lamping log, which is a talley of burned out lights or areas needing replamping as reported to the Electrical Shop General Foreman. The midnight shift of electricians has primary responsibility for ensuring that the log is reviewed daily and necessary relamping activities are completed.

Reference: EMSL-E44 PM 0977-247, performed quarterly

POST IMPLEMENTATION REVIEW

The electrical shop general foreman will review the lamping log daily and the assigned electricians will relamp as necessary.

RECOMMENDATION - INPO IV. C.1 (APPENDIX B)

Complete development of the simulator instructor program. Establish and implement a plan with achievable completion dates to ensure the items identified above are corrected.

INPO 86-026, Guidelines for Simulator Training, should be of assistance in this effort. The guideline also has sections applicable to some of the recommendations that follow.

RESPONSE

As stated in response to ORR item IX. D. implementation of simulator instructor training program will be a phased approach.

Execise guide development, prebriefing, post exercise critiques, and observation and evaluation skills will be included in the OTIL being developed as an interim program. This will be completed by June 30, 1988, and the program will be fully implemented by September 30, 1988.

CURRENT POLICY

OTIL in development.

POST IMPLEMENTATION EVALUATION

The post implementation evaluation will consist of a review of the simulator instructor training program and the OTIL to ensure that the following items are included:

1. pre-brief/post-exercise critique techniques
2. observation/evaluation skills
3. exercise guide development
4. rules of conduct for simulator sessions (not in conflict with AI-30)

Operations and training management will review simulator training sessions to evaluate instructor performance.

RECOMMENDATION - INPO IV C.2 (APPENDIX B)

Implement the following items to improve teamwork and diagnostic skills of the operating crews:

a. At the beginning of each requalification cycle, evaluate each operating crew. Use these evaluations to identify teamwork and diagnostic training needs. Conduct training tailored to these needs.

b. Incorporate teamwork and diagnostic related learning objectives, with appropriate performance standards in the simulator exercise guides and performance evaluation sheets.

c. Incorporate the feedback concept into diagnostic training.

d. Expand the scope of teamwork to include personnel outside the control room.

e. Use complete crews during all requalification simulator training.

RESPONSE

a. As stated in the response to ORR Item IX. C, the selection of topics for requalification training will be upgraded.

   A part of this upgrade will be to evaluate each crew based on simulator performance and plant performance for input to the selection of topics.

   See ORR Item IX.C for completion date.

b. Simulator exercise guides have been revised to include objectives drawn from applicable procedures governing duties and responsibilities for each operating crew member, including the STA.

   Additionally, an Observation Guide has been added to the simulator exercise guides to assist the simulator instructors in evaluating trainer against the appropriate performance standards.

   This item is complete.

c. The Observation Guide mentioned above includes criteria for diagnostic (analysis/decision making) evaluations.

   This item is complete.

d. The OTIL referenced in response to ORR item IX.D and INPO item IV.C.1 will include criteria for involving personnel outside the control room in simulator training.

This criteria will be developed by assessing the impact of such involvement on prioritized training requirements, resources (both costs and manpower) and the perceived advantages of including these personnel.

See ORR item IX.C for completion date.

e. Shift crews now train as a team. Rotation and training schedules for the STAs have been revised as described in the response to ORR item V.A to include the STA in requalification training with the operating crew.

This item is complete.

CURRENT POLICY

Refer to ORR IX.C

POST IMPLEMENTATION EVALUATION

Effectiveness of these item will be verified as stated in responses to ORR item IX. C. and V.A.

RECOMMENDATION - INPO IV.C.3

During the special training that will be conducted prior to unit 2 startup, include the following topics:

a. rod control
b. reactivity effects
c. shutdown margin
d. use of doubling
e. plant response during normal loading and unloading of the generator
f. communications

If the topics are already included, review the training materials for adequate depth and scope.

RESPONSE

The above topics have been included in the schedule for the startup training.

This training is scheduled to begin on February 1, 1988 and be complete prior to unit 2 startup.

CURRENT POLICY

These topics will be thoroughly covered in all future training classes as applicable.

Reference: Lesson Plan OPL271COOL, Reactor Theory, Operator Applications VI

Area Plan 0202.05, Training Program, Attachment 8.1, page 133

POST IMPLEMENTATION EVALUATION

Verification of the effectiveness of this corrective action will be accomplished by written examination and evaluation of simulator performance. Acceptance criteria for the written examination will be a minimum score of 80%. Acceptance criteria for the simulator evaluation will be overall satisfactory performance in the areas identified on the Observation Guide of the simulator exercise guides.

Verification of this action will be completed for each crew prior to unit 2 startup.

RECOMMENDATION - INPO IV.C.4

Improve plant management involvement in simulator training. Operating crews, including the shift technical advisor, should be periodically evaluated during each requalification cycle. The evaluation should include an assessment of crew performance and training effectiveness. Evaluation standards should be used to ensure consistent and meaningful assessments are conducted.

RESPONSE

A schedule for line management involvement in requalification training has been developed and implemented. This schedule covers both classroom and simulator training and has already been conducted for two weeks of requalification training.

A formal manager's observation checklist is being used during observations.

CURRENT POLICY

The requirement for line management to observe operator training has not been incorporated into a plant procedure but there is a published schedule for observation which extends through March 9, 1988. This will be an ongoing program.

Reference: Line Manager Observation Schedule for Requalification

POST IMPLEMENTATION VERIFICATION

Currently six managers in Operations are conducting the training observations. These managers include the Plant Manager, the Operations Superintendent, Manager of Operations, Manager Operations Support Group, Assistant to the Plant Manager (SRO) and Operations Unit 2 Manager. This action will be ongoing in coordination with the training schedule.

RECOMMENDATIONS - INPO IV. C.5 (APPENDIX B)

Incorporate industry operating events into simulator training. Consider using generic lesson plans that outline the key items the instructor should cover.

RESPONSE

A preliminary review of the impact of implementation of the Nuclear Experience Review (NER) program into the simulator training program has been conducted.

A plan to incorporate industry operating experience review into the simulator training program will be completed by June 30, 1988 and a schedule for implementation will be included.

CURRENT POLICY

The technical reviews of industry experience items are conducted by training group managers or their designees. Reviewers shall be responsible for determining applicability of NERs to their training programs, incorporating lessons learned into lesson plans or required readings, ensuring that staff and trainees are informed of significant operational events in a timely manner, and that reviews of NERs and resulting actions determined to be necessary are implemented and correspondence is issued by the assigned due date.

Reference: TCA-52, section 5.5, page 2.

POST IMPLEMENTATION EVALUATION

Managers from the Operations Department will observe simulator training sessions and determine if industry experience is addressed by the simulator exercise guides and during the conduct of the training.

RECOMMENDATION - INPO - IV.C.6 (Appendix B)

Evaluate the simulator configuration management program to ensure that the simulator is maintained current to the reference plant. Temporary modifications that are more than six months old should be considered for implementation on the simulator.
INPO 87-016, Simulator Configuration Management System, could be of assistance in this effort.

RESPONSE

See Concern - ORR IX.E

RECOMMENDATION - INPO IV.D.1 (APPENDIX B)

Provide radiological controls technicians specific guidance on their responsibilities when monitoring radiological work activities. Additionally, radiological control supervisors should periodically observe such activities and critically assess the adequacy of radiological controls coverage. Incidents resulting from deficient radiological control coverage of jobs should be fully evaluated and the practices contributing to the incident promptly upgraded and communicated to all radiological control technicians.

RESPONSE

Since November 1987 each radiological control shift supervisor has been conducting a minimum of one documented observation per week of technicians performing job coverage in RWP areas. This is in addition to the daily observations conducted by the shift supervisors as they conduct their routine duties. On-the-spot feedback from these observations is given to the involved technicians as necessary.

Radiological Control Technicians have been instructed by Radiological Control Managers, in crew meetings, to monitor worker compliance and to correct poor practices. RCI-1 Radiological Control Program defines the practices to be followed. Radcon Technicians have stop work authority for imminent danger and will be supported in its use.

The RWP program is being changed to clarify requirements on RWPs to ensure radiological conditions are sufficiently evaluated and necessary precautions are taken. Procedures will be changed to reflect the new requirements and technicians will be trained on the new requirements by March 31, 1988.

CURRENT POLICY

RCI-1 Radiological Control Program

POST IMPLEMENTATION FOLLOW-UP

The Superintendent, Radiological Control, Manager of Radiological Protection Group and Manager of Radiological Field Operations Group will observe RWP job coverage at least weekly. These observations will include a review of RWPs for adequacy, knowledge of the Radiological Control Technicians of the radiological aspects of the work, and verifying that workers are complying with the RWP as well with all other generally accepted radiological work practices for the work conditions.

These same managers are staying aware of the jobs requiring radiological control coverage and will involve themselves in the planning and conduct of jobs where significant exposure or contamination hazards are present. This is intended to become a way of doing business and not just short-term followup.

RECOMMENDATION - INPO IV.D.2 (APPENDIX B)

Discontinue the practice of allowing a group to enter a nonuniform high radiation area using just one dose rate integrating device to monitor exposure. Assign a device to each individual to prevent problems such as those noted above. Additionally, require periodic monitoring of these devices and self reading pocket dosimeters.

RESPONSE

Each worker entering a high radiation area will be equipped with a survey meter or alarming dosimeter unless the work is continuously monitored by a radiological control technician with an appropriate survey meter.

Procedure revision to RCI-3 has been revised to formalize this additional degree of control.

Workers are taught in General Employee Training to periodically read their self reading dosimeters. To help reinforce this, specific instructions are being placed on RWPs requiring the wearer of alarming dosimeters to periodically read the dosimeter. Radiological Control Technicians are being careful to ensure that self reading dosimeters are worn such that they can be read while working. In addition, worker responsibilities associated with the use of alarming dosimeters will be addressed in an advanced radiation worker training course scheduled to begin in October 1988.

CURRENT POLICY

Reference: RCI 3, "Personnel Dosimetry"

POST IMPLEMENTATION EVALUATION

The Superintendent, Radiological Control, or the Manager, Radiological Field Operations Group, will review sufficient Radiation Work Permits involving high radiation areas to ensure this requirement is being included.

Spot checks of work in progress in high radiation areas will be made to ensure that workers are being issued the proper monitoring instrumentation. Spot checks will be made by the Superintendent, Radiological Controls, and the Manager, Radiological Field Operations Group.

RECOMMENDATION - INPO IV D.3 (APPENDIX B)

Provide radiological controls technicians with specific criteria on what constitutes a breathing zone air sample. Supervisors should monitor radiological work activities to ensure air samples are sufficient and accurately reflect airborne radioactivity conditions.

RESPONSE

The instruction for conducting airborne radioactivity surveys (HPSIL-5) will be revised by February 27, 1988 to provide specific guidelines for representative sampling of breathing zone air.

Supervisors have been monitoring air sampling activities to ensure representative sampling and they will continue to monitor the air sampling program during selected maintenance activities to ensure compliance with requirements.

The Radiological Control Technician Training program addresses sampling of the breathing zone and Radiological Control instructors will emphasize this area in future training courses.

CURRENT POLICY

Radiological Control Technicians are expected to obtain samples that are representative of the airborne concentrations in the breathing zone.

Reference: HPSIL-5, Airborne Radioactivity Surveys

POST IMPLEMENTATION EVALUATION

The Superintendent, Radiological Controls, will verify that the procedure revision adequately instructs technicians on taking breathing zone samples.

The Superintendent, Radiological Controls, or the Manager, Radiological Field Operations Group, will observe work or drills involving airborne contamination at least once per week until sufficiently observed performances indicate that this is no longer a problem area. To the extent feasible each observation will involve different technicians. Individual weaknesses observed will be handled individually unless there are indications of a generic group weakness. In the latter case, training would be conducted for the whole group.

RECOMMENDATION - INPO IV.D.4 (APPENDIX B)

Develop a program that addresses the control of hot particle contamination at the station. Procedures should address particle detection, dose calculations and decontamination techniques. INPO SER 18-87, Revision 2, Radiation Exposure from Small Particles provides guidance in this area and should prove helpful in developing the program.

RESPONSE

Sequoyah Radiological Control Personnel are sensitive to the possible presence of radiologically "hot" particles. Nine such particles have been detected since June 1987. None involved significant exposure. These particles are typically found in laundered anti-contamination clothing where they could be transferred to a worker's skin. Partially because of this Sequoyah stopped dry cleaning anti-contamination clothing and sends all anti-contamination clothing to an off-site laundry for washing. It appears that this is more effective for hot particle removal from contaminated clothing. Clothes returning from the laundry are surveyed for the presence of hot particles.

Currently, Sequoyah is relying on correct frisking and portal monitors at the exit of the Radiological Control Area (RCA) to detect hot particles on workers or equipment exiting the RCA.

A number of other actions have been initiated which will improve hot particle control. These actions, which follow, will be completed by March 1, 1988.

1. Revise, HPSIL-2, Contamination Surveys, to provide survey techniques to detect the presence of hot particles during personnel, equipment and area surveys using portable instrumentation.

2. Revise, HPSIL-10, Personnel Decontamination, to address personnel survey requirements necessary to support an accurate dose assessment of a hot particle found on an individual.

3. Revise, HPSIL-4, Routines, to make daily routine surveys of regulated area clean zones for transferable contamination by a technique which will more effectively identify the presence or absence of hot particles.

4. Include in the current development of new respiratory protection procedures, the selection criteria for respiratory protection devices to be used in zones with known or suspected hot particle contamination.

5. Develop a procedure to optimize the efficiency of the new laundry monitor to identify the presence of hot particles on protective clothing.

6. Complete procurement actions for new whole body contamination monitors (portal type monitors). Expected delivery to Sequoyah is in mid-March 1988.

CURRENT POLICY

HPSIL 10 Discusses personnel decontamination and the actions to take if a person is contaminated with a hot particle.

DOS 3 This is a corporate procedure for the determination of dose equivalent due to radioactive contamination of the skin. This procedure has been validated for hot particle contamination.

POST IMPLEMENTATION EVALUATION

The Superintendent, Radiological Control, will review the procedures for surveys, decontamination, respiratory protection, and laundry monitoring to ensure that procedures are adequate to detect hot particles and that the radiation exposure risk can be reasonably estimated.

The Superintendent, Radiological Controls; Manager, Radiological Protection Group; and Manager of Radiological Field Operations Group will observe these procedures being tested for a hot particle (point source) geometry to determine if the response expected by the procedure writer is obtained from the instruments involved.

RECOMMENDATION - INPO IV.D.5 (APPENDIX B)

Calibrate the multi-channel analysis equipment for a point source geometry. Implement that geometry in the system software and utilize it for isotopic analysis of all detected hot particles.

RESPONSE

Calibration sources for calibrating gamma spectroscopy systems for a point source geometry were ordered in December 1987.

Geometry calibration factors will be incorporated into the appropriate efficiency curves after receipt of these sources and calibration of the detectors. Technical Instruction (TI) 49 will be revised to include the new calibration factors. This should be complete no later than April 1, 1988.

Until the calibration source for a point source geometry is obtained and a calibration established, the activity of any hot particle will be estimated by analysis using the same geometry (except for distance) used for analyzing particulate air samples. If personnel dosimetry is an issue with any hot particle, an independent analysis will be obtained.

The Chemistry Group Manager will coordinate with the Radiological Control Superintendent to ensure that interim measures are in place as necessary to analyze and safely store any hot particles that involve dosimetry concerns until confirmation analyses can be performed.

CURRENT POLICY

Reference: TI-49, Radiological Chemical Laboratory Test Equipment Calibration Program

POST IMPLEMENTATION EVALUATION

The Chemistry Group Manager will verify that TI-49 has been verified and that the gamma spectroscopy system has been calibrated for a point source by having a radiochemistry specialist demonstrate the analysis. Verification of these corrective actions will be accomplished by incorporation into TI-49.

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RECOMMENDATION - INPO IV.D.6 (APPENDIX B)

Prevent the frequent inclusion of green radioactive waste bags in yellow radioactive waste bags. Identify the work groups contributing to the problem and take appropriate corrective action.

RESPONSE

Upon investigation, it was found that some of the green bags in yellow bags were there because of an unclear policy regarding the disposal of clean anti-contamination clothing and supplies. Damaged but clean yellow plastic booties were being placed in green bags. The green bags were being rejected for clearance by the radiological control technicians because they contained yellow materials. The people cleaning up in the plant have been instructed to place yellow material in yellow bags regardless of contamination.

For the long term, a new position (Supervisor, Decontamination Unit) has been established in the Water and Waste Processing Group which will have responsibility for improving waste segregation program. The position has been filled and an improved program will be implemented by December 31, 1988.

CURRENT POLICY

The following is excerpted from SQA-133.

A method of waste segregation should be implemented to reduce the amount of radioactive waste. Yellow and green bags will normally be used to accomplish this. It may be necessary; however, to designate other containers for the collection of wastes.

A. Green bags will be located throughout the Radiological Controls Area (RCA) for the collection of noncontaminated wastes. Items collected in green bags will be surveyed by RADCON and will meet the requirements of RCI-1 before being released from the RCA. If cleared by RADCON, they may be discarded without further restrictions as non-contaminated waste.

B. Yellow bags will be located at the entrance and exits to C-zones for the collection of radioactive contaminated waste. All waste collected in yellow bags will be surveyed by RADCON. Waste which is decermined to be contaminated will be appropriately bagged and transported to the waste packaging area.

Reference: SQA-133 Radioactive Waste Management Program

POST IMPLEMENTATION EVALUATION

The Manager, Water and Waste Processing, and the Supervisor, Decontamination Unit, will periodically observe waste packaging operations and talk with the compactor operators to determine the frequency with which green bags are showing up in the waste packaging area. Additional training or other emphasis will be used to make workers aware of the necessity to segregate wastes. This will be an ongoing program.

RECOMMENDATION - INPO IV.A. (APPENDIX. C)

Review the bases of the fold-out page and the appropriate sections of E-1 with all licensed personnel and instructors. Review the use of these procedures, practice them on the simulator, and ensure all personnel can use E-1 and the emergency instruction fold-out page.

RESPONSE

This recommendation pertains to the lack of familiarity of the operating crews with the use of a fold out page included in emergency instruction E-1.

Emergency Instruction E-1 was revised on January 19, 1988 to clarify step 14. The operating crews are required to familiarize themselves with the revision in accordance with OSLT-1.

Week 1 Requalification contains a simulator scenario which requires the usage of Emergency Instruction E-1 through step 14.

Additionally, the special startup training commencing February 1, 1988 (refer to INPO IV. A-1) will include classroom instruction on the use of E-1 and the instruction fold-out page.

Week 2 Requalification training currently includes further simulator training on the use of E-1.

CURRENT POLICY

Licensed operators will satisfactorily complete training on standard and emergency operating procedures for the facility and plant.

Reference: Area Plan 0202.05 Attachment 8.1, page 133

POST IMPLEMENTATION VERIFICATION

Verification of the effectiveness of the above specified training will be accomplished by evaluation of simulator performance during Week 2 Requalification 1988.

Acceptance criteria will be satisfactory performance on the simulator.

RECOMMENDATION - INPO FOLLOWUP IV.B (APPENDIX C)

Provide the crew training to correct the problems noted above. The training should address the following topics:

a. emergency instruction bases

b. emergency instruction rules of usage

c. conduct of operations

d. communication techniques

e. fundamentals of diagnostics, with emphasis on attention-to-detail, control panel monitoring, as well as analyzing, predicting, and tracking of plant parameters and responses

f. simulator practice sessions that enforce teamwork, diagnostic fundamentals, and use of procedures

In addition, provide the SE and ASE with supervisory skills training, and include coaching and guidance from operations management on expected control room command behavior.

RESPONSE

This recommendation pertains to one crew that was observed to be weaker than the others observed by INPO.

A five-day training course was developed for the crew identified by INPO and conducted January 4, 1988 through January 8, 1988 (Schedule and topics attached).

The shift supervisor has been replaced on the crew by a more experienced shift supervisor. Both shift supervisors attended the special training.

The Assistant Shift Supervisor has received supervisory coaching from operations management.

CURRENT POLICY

N/A

POST IMPLEMENTATION EVALUATION

Verification of the effectiveness of this corrective action was accomplished by simulator performance evaluation by training and operations management.

Satisfactory simulator performance was noted, with improved communication teamwork, diagnostic ability, and attention to detail.

This verification was completed on January 8, 1988.